

## BIOLOGY (BIOL)

For Undergraduates Only

- 1010. BIOLOGICAL PRINCIPLES I.** (3-3-0). This is the first course in a three-part survey of fundamental biological science at NSU (Biology 1020 and 2020 are the other two parts). Emphasis is placed on the molecular basis of life, cell structure, metabolism, reproduction, genetics, and gene expression. Corequisite: BIOL 1011. (Students may not receive credit for both Biology 1010 and Science 1020).
- 1011. BIOLOGICAL PRINCIPLES LABORATORY I.** (1-0-2). This is a companion laboratory of BIOL 1010. Corequisite: BIOL 1010.
- 1020. BIOLOGICAL PRINCIPLES II.** (3-3-0). This is the second course in a three-part survey of fundamental biological science at NSU (Biology 1010 and 2020 are the other two parts). Emphasis is placed on diversity of life on earth, and animal form, function, and development. Prerequisite: BIOL 1010-1011; Corequisite: BIOL 1021. (Students may not receive credit for both Biology 1020 and Science 2020).
- 1021. BIOLOGICAL PRINCIPLES LABORATORY II.** (1-0-2). This is a companion laboratory of BIOL 1020. Corequisite: BIOL 1020.
- 1060. MEDICAL TERMINOLOGY.** (3-3-0). The study and practical application of a medical vocabulary system. Includes structure, recognition, analysis, definition, spelling, pronunciation, and combination of medical terms from prefixes, suffixes, and roots.
- 2020. BIOLOGICAL PRINCIPLES III.** (3-3-0). This is the third course in a three-part survey of fundamental biological science at NSU (Biology 1010 and 1020 are the other two parts). Emphasis is placed on plant form and function, ecology, behavior, and evolution. Prerequisites: BIOL 1010, 1020. Co-requisite: BIOL 2021.
- 2021. BIOLOGICAL PRINCIPLES LABORATORY III.** (1-0-2). This is a companion laboratory for BIOL 2020. Prerequisite: registration in or credit for BIOL 2020.
- 2030. INTRODUCTION TO GEOGRAPHIC INFORMATION SYSTEMS.** (3-3-0). Fundamental principles of Geographic Information Systems (GIS), including components of a GIS, data availability and format, data models, map projections, georeferencing, and image classification. Prerequisite: satisfactory completion of the mathematics core (six hours). Corequisite: Enrollment in 2031.
- 2031. INTRODUCTION TO GEOGRAPHIC INFORMATION SYSTEMS LABORATORY.** (1-0-3). Computer exercises on various topics in GIS. Corequisite: Enrollment in 2030.
- 2040. INTRODUCTORY ANIMAL SCIENCE.** (3-3-0). Modern animal agriculture; problems of breeding, feeding, management, and marketing.
- 2050. INVERTEBRATE ZOOLOGY.** (2-2-0). Morphology, taxonomy, physiology, life history, evolution, ecology, and economic importance of the major invertebrate phyla. Prerequisites: Registration in or credit for 2051; Biology 1020-1021.
- 2051. INVERTEBRATE ZOOLOGY LABORATORY.** (2-0-4). Prerequisite: Registration in or credit for 2050.
- 2060. MICROBIOLOGY I.** (3-3-0). This introductory course is designed to acquaint students with microorganisms and their activities. Topics covered include microbial cell structure and function, metabolism, and genetics, as well as the control of microbial growth, and the role of microorganisms in disease. Corequisite: BIOL 2061. (Students may not receive credit for both BIOL 2060 and BIOL 1130.)
- 2061. MICROBIOLOGY LABORATORY I.** (1-0-3). This course is designed to introduce students to basic techniques in microbiology, such as laboratory safety, aseptic technique, microscopy, staining, culturing, and quantification. Corequisite: BIOL 2060.
- 2070. FORENSIC ENTOMOLOGY.** (3-3-0). The scientific examination of insects and other arthropods associated with the decomposition of human and animal remains, feedstuffs, as well as insects or their parts associated with humans or their activities. Prerequisite: BIOL 1020-1021. Co-requisite: 2071.
- 2071. FORENSIC ENTOMOLOGY LABORATORY.** (1-0-3). The forensic entomology laboratory will familiarize students with the biology and identification of insects and other arthropods of forensic significance. Co-requisite: 2070.
- 2080. COMPARATIVE ANATOMY.** (2-2-0). The vertebrate systems, morphology, taxonomy, and evolution of the chordate groups; comparative dissections of dogfish, necturus and cat. Prerequisites: Biology 1020-1021. Co-requisite: Biology 2081.
- 2081. COMPARATIVE ANATOMY LABORATORY.** (2-0-4). Co-requisite: BIOL 2080.
- 2090. MICROBIOLOGY II.** (3-3-0). This course is a continuation of Microbiology I. The role of microbes in diverse natural systems, microbial nutrition, growth ecology, genetics, metagenomics and environmental interactions will be explored. Prerequisite: BIOL 2060.
- 2091. MICROBIOLOGY LABORATORY II.** (1-0-3). This course is designed to introduce students to the advanced techniques encountered in microbiology laboratories, such as determining bacterial growth curves and enumeration via plating, direct count, UV measurement, flow cytometry. The growth rates will be measured as influenced by temperature, pH, osmotic pressures via salts and other environmental pressures. Culturing of anaerobic bacteria with emphasis on biodegradation and industrial production will be investigated. Prerequisite: Credit in BIOL 2061 and registration in BIOL 2090.
- 2100. GENERAL BOTANY.** (2-2-0). Structure and functions of plant cells, tissues, and organs; nutrition, metabolism, water relations, growth of plants. Prerequisite: Registration in or credit for 2101; Biology 1020-1021 or consent of instructor.
- 2101. GENERAL BOTANY LABORATORY.** (1-0-2). Prerequisite: Registration in or credit for 2100.
- 2120. SOIL SCIENCE.** (2-2-0). Fundamentals. Origin, composition, and classification of soils; their physical, chemical, and biological properties; significance of these properties to soil-plant relationships and soil management. Prerequisite: registration in or credit for CHEM 1040, 1031, 1041, or 1070. Co-requisite: BIOL 2121.
- 2121. SOIL SCIENCE LABORATORY.** (1-0-2). Co-requisite: BIOL 2120.
- 2140. INTRODUCTORY PLANT TAXONOMY.** (1-1-0). Identification and classification of local seed plants and ferns; field trips and collections; keys, manuals and herbaria. Prerequisite: Registration in or credit for 2141; Biology 1020-1021.
- 2141. INTRODUCTORY PLANT TAXONOMY LABORATORY.** (2-0-4). Prerequisite: Registration in or credit for 2140.
- 2150. DENDROLOGY.** (2-2-0). Principal trees of Southeast U.S.; identification and distribution; introduction to keys. Prerequisite: Registration in or credit for 2151.
- 2151. DENDROLOGY LABORATORY.** (1-0-2). Field identification of trees of Southeast U.S. Prerequisite: Registration in or credit for 2150.
- 2180. NATURAL RESOURCES POLICY.** (3-3-0). This course examines the evolution of wildlife, fisheries, and other natural resources policy, law, and administration in the United States. Historical development, present laws, and likely future trends will be examined. Emphasis will be placed on federal laws and agencies, along with the influence of federal policies on state agencies. Additional topics include a survey of the administration and responsibilities of Louisiana's natural resources agencies, the influence of non-government organizations on natural resources policy, and international policies.

- 2190. SURVEY OF MYCOLOGY.** (3-3-0). This course provides a survey of the field of mycology. Focus will be placed on understanding the general nature, structure, function, and biochemistry of the fungi as well as their roles/impact in the environment, biotechnology, and health/medicine. Prerequisite: BIOL 2080, junior standing or permission of instructor.
- 2200. GENERAL PARASITOLOGY.** (2-3-0). Ecto-and endoparasites of animals; parasites of public health importance; control measures. Prerequisites: BIOL 1010-1011, 1020-1021. Co-requisite: BIOL 2201. Same as Veterinary Technology 2100.
- 2201. GENERAL PARASITOLOGY LABORATORY.** (2-0-2). This is companion a companion laboratory of BIOL 2200. Co-requisite: BIOL 2200. Same as Veterinary Technology 2101.
- 2210. MICROBIOLOGY FOR NURSING AND ALLIED HEALTH MAJORS.** (3-3-0). An introduction to the subject of microbiology, including: basic microbial cell structure and function, microbial metabolism, control of microbial growth, and the impact of microbes on human health. Students may not receive credit for this course and BIOL 2060. Co-requisite: BIOL 2211 (for BSN majors only).
- 2240. INTRODUCTORY HUMAN GENETICS.** (3-3-0). Fundamental concepts and tools in modern medical practice of genetics. Emphasis is placed on: principles of inheritance, normal and pathological genetic variation in humans, and modern techniques used in identification and screening of genetic disorders. Students may not receive credit for this course and BIOL 3270.
- 2250. ANATOMY AND PHYSIOLOGY I FOR NURSING AND ALLIED HEALTH MAJORS.** (3-3-0). This course is the first of a two-part series designed to provide Nursing and Allied Health majors with a foundation in human biology with emphasis on clinical aspects and the interrelatedness of organ systems. This course covers cell biology, histology, and structure and function of the integumentary, musculoskeletal, and nervous systems.
- 2251. ANATOMY AND PHYSIOLOGY LABORATORY I FOR NURSING AND ALLIED HEALTH MAJORS.** (1-0-2). This is a companion lab for BIOL 2250. Prerequisite: Registration in or credit for BIOL 2250.
- 2260. ANATOMY AND PHYSIOLOGY II FOR NURSING AND ALLIED HEALTH MAJORS.** (3-3-0). This course is the second of a two-part series designed to provide Nursing and Allied Health majors with a foundation in human biology with emphasis on clinical aspects and the interrelatedness of organ systems. This course covers structure and function of the endocrine, circulatory, immune, respiratory, digestive, urinary, and reproductive systems. Prerequisite: BIOL 2250.
- 2261. ANATOMY AND PHYSIOLOGY LABORATORY II FOR NURSING AND ALLIED HEALTH MAJORS.** (1-0-2). This is a companion lab for BIOL 2260. Prerequisite: Registration in or credit for BIOL 2260.
- 2290. INTRODUCTION TO WILDLIFE AND FISHERIES MANAGEMENT.** (3-3-0). Survey of wildlife populations including ecology and management principles. Emphasis on resident wildlife of the South including white-tailed deer, wild turkey, rabbits, tree squirrels, bob-white quail, alligators, and other game, non-game, exotic and endangered species and predators. Survey of fish populations including biology and management principles. Emphasis on resident warm-water fish and coastal anadromous species management to include largemouth bass, striped and hybrid striped bass, sunfish, crappie, catfish, and other species of interest. Pond and reservoir management will be addressed as well as commercial fisheries and aquaculture. Management of organisms, habitats, and human users will be examined from an ecological and sociological perspective.
- 2950. BIOLOGY LABORATORY TEACHING PRACTICUM.** (1-0-3). Specifically designed to involve students in the preparation and evaluation of a biology laboratory through direct participation in laboratory activities. Field experiences required. May be repeated for up to a total of 3 credit hours. Prerequisite: 1011-1021.
- 2990. ENVIRONMENTAL LAW.** (3-3-0). This course will provide students with an overview of some of the major environmental statutes in the United States; address the variety of regulatory tools and concepts that can be used to prevent environmental harm, focusing on the proper match between regulatory tool and environmental harm; and discuss the role of other disciplines (e.g., science) and alternative means (e.g., public awareness) to facilitate changes in environmental policy. Prerequisite: Six hours of microbiology and core English completion.
- 3010. ENTOMOLOGY.** (2-2-0). Introduction to Phylum Arthropoda. Fundamentals of morphology, physiology, systematics, and life histories. Prerequisites: Registration in or credit for 3011; Biology 1020-1021.
- 3011. ENTOMOLOGY LABORATORY.** (1-0-3). Prerequisite: Registration in or credit for 3010.
- 3020. PHARMACOLOGY.** (3-3-0). This course is designed to offer a description of the clinical use of pharmacological agents, and provide an understanding of the mechanisms by which therapeutics alter biological function. Each class of FDA approved drug products will encompass the effects of medications on different organ systems, and in the context of clinical diagnoses of disease. Prerequisite: CHEM 1040.
- 3030. DISEASES OF FARM ANIMALS.** (3-3-0). Causative agents, prevention, diagnosis and treatment. Prerequisite: BIOL 2040; VTEC 2090-2091, or consent of instructor.
- 3040. ORNITHOLOGY.** (2-2-0). Techniques of bird study; adaptive significance and evolution of bird behavior, ecology, physiology and morphology; field identification and natural histories of Louisiana species. Prerequisite: Registration in or credit for 3041; Biology 1020-1021.
- 3041. ORNITHOLOGY LABORATORY.** (1-0-3). Prerequisite: Registration in or credit for 3040.
- 3050. PRINCIPLES OF ANIMAL NUTRITION.** (3-3-0). Digestion, absorption, utilization, chemical composition values of nutrients. Prerequisite: Four hours of general chemistry and three to four hours of organic chemistry.
- 3060. BIOSTATISTICS.** (3-3-0). Statistical analysis of biological data. Parametric and nonparametric statistics. Prerequisite: Mathematics 1020.
- 3061. BIOSTATISTICS LABORATORY.** (1-0-2). This is a companion laboratory of BIOL 3060. Students will be introduced to the programming language R, which is designed for statistical analysis and graphical representation of data. Data analysis will complement and augment topics covered in BIOL 3060. Co-requisite: BIOL 3060.
- 3090. FOOD MICROBIOLOGY.** (2-2-0). Role of microorganisms in food industries, their focus on disease-causing microbes associated with food; as well as the use of microbes in food production. Prerequisite: 2060 and 2061.
- 3091. FOOD MICROBIOLOGY LABORATORY.** (2-0-4). Laboratory techniques used in the detection, elimination and prevention of disease-causing microbes associated with food; utilization of microbes in food production. Prerequisite: 2060 and 2061.
- 3100. SOIL MICROBIOLOGY.** (3-3-0). This course is designed to cover the effects of soil environments on microbial occurrence; relationships and significance of microbes to mineral transformations, plant development, and environmental quality; and management of soil microorganisms in different ecosystems. Prerequisites: BIOL 2080, CHEM 1030.

- 3110. GEOMICROBIOLOGY.** (3-3-0). Microbial life below the earth's surface. The course will explore the microbial role of the geochemical cycling of carbon, nitrogen, sulfur, and metals, as well as the degradation of organic pollutants and the advantageous or deleterious impact of microorganisms in the petroleum and gas industry. Prerequisite: BIOL 2080.
- 3120. MICROBIOLOGY OF WASTEWATER.** (3-3-0). This course is to introduce the students to the various methods and processes used in the treatment of potable water before human and selected industrial usages. Also, the various aspects of chemical and microbial wastewater disposition into natural water bodies will be established. The Clean Water Act as well as state and local regulations will be covered to ensure a potable water source for human consumption and discharge into ecosystems. Prerequisite: BIOL 2080.
- 3130. SURVEY OF APPLIED GENOMICS.** (3-3-0). This lecture course is designed to provide students with a broad overview of modern genomics, the human genome, microbial genomes, and comparative genomics. Emphasis is placed on the application of genomics, as well as exploiting environmental genomes via genomic database tools. Prerequisite: BIOL 2080 or BIOL 3210.
- 3140. HERPETOLOGY.** (2-2-0). Classification, structure, evolution, natural history, and distribution of amphibians and reptiles. Laboratory emphasis on Louisiana forms. Collection required. Prerequisite: BIOL 2080-2081, or consent of instructor. Co-requisite: BIOL 3141.
- 3141. HERPETOLOGY LABORATORY.** (1-0-3). Co-requisite: BIOL 3140.
- 3170. HISTOLOGY.** (2-2-0). Cytology and microanatomy of animal tissues, principally mammalian. Prerequisites: BIOL 1020-1021, 2080-2081. Co-requisite: BIOL 3171.
- 3171. HISTOLOGY LABORATORY.** (2-0-4). Co-requisite: BIOL 3170.
- 3220. WILDLIFE MANAGEMENT AND TECHNIQUES.** (3-3-0). Methods and principles of studying animal populations; population growth, movements, measurements and modeling; habitat management and alteration; legislation and wildlife management; administration and planning; management applications to big game, small mammals, water-fowl, shore and upland birds, non-game, endangered and exotic species; animal damage and impacts. Prerequisites: Registration in or credit for 3221; Biology 1020-1021.
- 3221. WILDLIFE MANAGEMENT AND TECHNIQUES LABORATORY.** (1-0-3). Use of literature to include data bases; research methods; population dynamics; control of animal populations; values of regulations, refuge system, artificial propagation, predator control and habitat improvement; trapping, tapping, marking, telemetry procedures; restoration, restocking and hacking programs; field trips to area wildlife management agencies at federal, state, and private levels. Three-day weekend trip to an area such as Rockefeller Wildlife Refuge is required. Prerequisite: Registration in or credit for 3220.
- 3250. CELL BIOLOGY.** (3-3-0). This course is designed to provide students with a fundamental understanding of basic cellular functions. Emphasis is placed on cell structure, organelle function, intracellular transport mechanisms, and intracellular and extracellular signaling. Prerequisites: BIOL 1010-1011. Co-requisite: BIOL 3251.
- 3251. CELL BIOLOGY LABORATORY.** (1-0-3). This is a companion laboratory for BIOL 3250. Prerequisite: registration in or credit for BIOL 3250.
- 3270. GENETICS.** (3-3-0). Principles of heredity and their application to plants and animals, including man. Prerequisite: Eight hours of biological sciences to include either Biology 1020-1021, or SBIO 1830-1831. Corequisite: 3271.
- 3271. GENETICS LABORATORY.** (1-0-3). This lab is designed to introduce the students to basic techniques in microbial and yeast genetic analyses. Emphasis is placed on demonstrating experimentally the topics discussed in BIOL 3270. Prerequisite: Eight hours of biological sciences to include either Biology 1020-1021, or SBIO 1830-1831. Corequisite: 3270.
- 3280. EVOLUTION.** (3-3-0). This course is designed to introduce students to the basic mechanisms of evolution, including adaptive and neutral processes. Evolution will be examined at scales ranging from molecular to ecological, and in populations over a few generations to over millennia. Emphasis will be placed on connections of evolution to molecular, developmental, and behavioral biology, physiology, genetics, ecology and environmental science. Prerequisite: BIOL 2020.
- 3290. EPIDEMIOLOGY.** (3-3-0). Spread and control of infectious diseases; role of hospital personnel in diagnosis, spread, and control of infection in the hospital and community. Prerequisite: BIOL 1130 or 2060.
- 3310. HUMAN ANATOMY AND PHYSIOLOGY I.** (3-3-0). This course and BIOL 3320, are a two-part series designed to provide Biology majors interested in health care professions with an integrated understanding of the structure and function of human organ systems. BIOL 3310 covers the integumentary, skeletal, muscular, and nervous systems. Prerequisites: BIOL 1010, 1020. Co-requisite: BIOL 3311.
- 3311. HUMAN ANATOMY AND PHYSIOLOGY LABORATORY I.** (1-0-3). This is a companion laboratory for BIOL 3310. Prerequisite: registration in or credit for BIOL 3310.
- 3320. HUMAN ANATOMY AND PHYSIOLOGY II.** (3-3-0). This course and BIOL 3320, are a two-part series designed to provide Biology majors interested in health care professions with an integrated understanding of the structure and function of human organ systems. BIOL 3320 covers the endocrine, cardiovascular, lymphatic, respiratory, digestive, urinary, and reproductive systems. Prerequisite: BIOL 3310. Co-requisite: BIOL 3321.
- 3321. HUMAN ANATOMY AND PHYSIOLOGY LABORATORY II.** (1-0-3). This is a companion laboratory for BIOL 3320. Prerequisite: registration in or credit for BIOL 3320.
- 3330. DAIRY AND AGRARIAN MICROBIOLOGY AND REGULATIONS.** (3-3-0). This course will introduce the student to the harvesting, processing and production of products from dairy and poultry livestock. Milk/egg quality, cheese and ice cream production will be covered with emphasis on pathogen detection and prevention. The composting of manures, milking barns, pasture runoff and buffer zones for nutrient and microbial "trapping" will also be investigated along with the state and federal standards for small and commercial production. Prerequisites: BIOL 2090, 2091, and junior standing.
- 3340. ANIMAL BEHAVIOR.** (3-3-0). Perception of the external world; orientation; motivation; social behavior; communication. Prerequisites: Biology 1020-1021; junior standing.
- 3341. ANIMAL BEHAVIOR LABORATORY.** (1-0-3). Experiments designed to illustrate the principles of animal behavior; communication. Prerequisites: Biology 1020-1021; or consent of instructor; junior standing.
- 3500. FORENSIC DEATH INVESTIGATION.** (3-3-0). The scientific techniques used in medicolegal investigations, injury and death, firearm injuries, transportation injuries, physical injuries, trauma and disease, asphyxial deaths, infanticide and forensic evidence and records for the court. Prerequisite: BIOL 1020-1021, 2070-2071. Co-requisite: 3501.
- 3501. FORENSIC DEATH INVESTIGATION LABORATORY.** (1-0-2). The laboratory will address physical evidence associated with human remains including forensic botany and palynology, serology, taphonomy and anthropology. Co-requisite: 3500.

- 3900. SPECIAL TOPICS IN BIOLOGY.** (1 to 3-1 to 3-0). In-depth study of various upper-level elective topics in the biological sciences; in particular, those not included explicitly among the catalog listings. Prerequisite: 1010/1011, 1020/1021 or consent of instructor.
- 3901. SPECIAL TOPICS IN BIOLOGY LABORATORY.** (1 to 3-0-1 to 9). In-depth laboratory component of various upper-level elective topics in the biological sciences; in particular, those not included explicitly among the catalog listings. Prerequisite: 1010/1011, 1020/1021 or consent of instructor. Co-requisite: 3900.
- 4040. MAMMALOLOGY.** (3-3-0). Behavior, ecology, physiology, morphology, evolution and zoogeography of mammals; taxonomy of mammals of the world; techniques of mammal study; identification of Louisiana species. Prerequisites: Registration in or credit for 4041; Biology 1020-1021.
- 4041. MAMMALOLOGY LABORATORY.** (1-0-3). Prerequisite: Registration in or credit for 4040.
- 4050. BIOREMEDIATION.** (3-3-0). This course will provide students with knowledge and approaches to identify and biostimulate potential treatment zones. Bioremediation strategies from in situ (microorganisms and plants), solid phase, slurry phase, vapor-phase soil and subsurface environment (aerobic and anaerobic) will be explored. Also, the fate and transport of selected contaminants will be covered with respect to the necessary microbial and ecology, metabolism, and the biodegradation for the targeted contaminants. Prerequisites: BIOL 2090 3110, 3120.
- 4120. PATHOGENIC MICROBIOLOGY.** (3-3-0). Microorganisms that cause disease in man and animals; their isolation and identification; mechanisms of disease causation; and methods of control. Prerequisites: BIOL 2060-2061. Co-requisite: BIOL 4121.
- 4121. PATHOGENIC MICROBIOLOGY LABORATORY.** (1-0-3). Co-requisite: BIOL 4120.
- 4150. ANIMAL BREEDING.** (3-3-0). Basic genetic principles in livestock breeding and selection; use of heritability estimates, inbreeding and crossbreeding. Prerequisite: BIOL 2040; three hours of genetics; senior standing or consent of instructor.
- 4160. BIOLOGICAL SCIENCES INSTRUMENTATION.** (1-1-0). This course introduces students to the theoretical principles behind major biological instruments, and to their practical use in research and analytical laboratories. Prerequisite: BIOL 2060-2061, 4300-4301.
- 4161. BIOLOGICAL SCIENCES INSTRUMENTATION LABORATORY.** (2-0-4). This is a companion laboratory of BIOL 4160. Co-requisite: BIOL 4160.
- 4170. LIMNOLOGY-AQUATIC BIOLOGY.** (2-2-0). Physical, chemical and biological properties of inland waters. Prerequisites: Registration in or credit for 4171; Biology 1020-1021; six hours of chemistry.
- 4171. LIMNOLOGY-AQUATIC BIOLOGY LABORATORY.** (1-0-3). Prerequisite: Registration in or credit for 4170.
- 4180. BIOLOGY OF FISHES.** (2-2-0). Taxonomy, anatomy, physiology, evolution life history and ecology of fresh-water fishes. Prerequisites: registration in or credit for 4181; 2060-2061, or consent of instructor.
- 4181. BIOLOGY OF FISHES LABORATORY.** (1-0-3). Prerequisite: registration in or credit for 4180.
- 4190. IMMUNOLOGY.** (3-3-0). This course is designed to provide students with a fundamental understanding of immune responses. Topics covered include the cells and tissues of the innate and acquired immune systems, antibody production, lymphocyte activation and specificity, and immune effector functions. Prerequisites: BIOL 2060-2061, 3250-3251. Co-requisite: BIOL 4191. BIOL 3270-3271 strongly recommended but not required.
- 4191. IMMUNOLOGY LABORATORY.** (1-0-3). This course is designed to introduce students to basic techniques in immunology. Emphasis is placed on exploring antigen-antibody interactions. Co-requisite: BIOL 4190.
- 4210. APPLIED MICROBIOLOGY.** (2-2-0). Microbiological aspects of milk, food, industry, soils, water and domestic wastes. Prerequisite: 2060-2061. Co-requisite: BIOL 4211.
- 4211. APPLIED MICROBIOLOGY LABORATORY.** (2-0-4). Co-requisite: BIOL 4210.
- 4220. COMPARATIVE VERTEBRATE PHYSIOLOGY.** (3-3-0). Comparison of the physiological adaptation of various vertebrate groups to their environment. Water balance, body temperature and energy metabolism, respiration, circulation, sensory and nervous systems. Prerequisites: BIOL 2220-2221 or 2080-2081. Co-requisite: BIOL 4221.
- 4221. COMPARATIVE VERTEBRATE PHYSIOLOGY LABORATORY.** (1-0-3). Co-requisite: BIOL 4220.
- 4270. VIROLOGY.** (3-3-0). This course is designed to provide students with a fundamental understanding of the basic biological properties of animal viruses. Emphasis is placed on viral life cycles (including replication and gene regulation), viral pathogenesis, and virus-host cell interactions. Prerequisite: BIOL 2060-2061; BIOL 3270 strongly recommended but not required.
- 4280. PATHOPHYSIOLOGY.** (3-3-0). This course provides an in-depth study of human pathological processes and their effects of homeostasis. Emphasis is on interrelationships among organ systems in deviations from homeostasis. Course topics include the etiology, clinical manifestations, and complications of commonly occurring diseases. Prerequisites: BIOL 3310 and BIOL 3320 or BIOL 2080 and BIOL 4220.
- 4300. MOLECULAR BIOLOGY I.** (3-3-0). This is the first course in a two-part series designed to introduce students to the principles and practices of Molecular Biology. BIOL 4300 covers, in depth, the core cellular functions: replication, recombination, repair, transcription and translation. Emphasis is placed on the intricate and highly interconnected regulatory mechanisms that control these functions, including the temporal and spatial order of gene expression, signal transduction mechanisms, as well as the field of Bioinformatics. Prerequisite: BIOL 1010, 1020, 2060, 3250, and 3270. Co-requisite: BIOL 4301.
- 4301. MOLECULAR BIOLOGY LABORATORY I.** (1-0-3). This is a companion laboratory to BIOL 4300. Students will be introduced to the most common techniques of modern molecular biology, including PCR, recombinant DNA technology, and DNA fingerprinting. Co-requisite: BIOL 4300.
- 4310. MOLECULAR BIOLOGY II.** (3-3-0). This is the second course in a two-part series designed to introduce students to the principles and practices of Molecular Biology. BIOL 4310 expands of the topics covered in BIOL 4300 and discusses them from a different perspective. In addition to studying "what goes on" in the cell, students will be introduced to the scientific methodologies used to arrive at our current knowledge, i.e., "how we got here". Additional emphasis is placed on emerging technologies including genomic and proteomic analyses, gene therapy and designer therapeutics. Prerequisite: BIOL 4300-4301. Co-requisite: BIOL 4311.
- 4311. MOLECULAR BIOLOGY LABORATORY II.** (1-0-3). This is a companion laboratory to BIOL 4310. Students will be introduced to advanced techniques of modern molecular biology, including cloning, expression of recombinant proteins, and monitoring of gene expression activity. Co-requisite: 4310.
- 4320. CANCER BIOLOGY.** (3-3-0). This course will explore the complex and often paradoxical factors involved in the etiology, progression and treatment of cancer. Students will discuss cancer from different perspectives, including epidemiology, physiology, genetics, immunology, molecular, and cellular biology. Prerequisites: BIOL 3250, 3270, and 4190.

- 4350. BIOLOGICAL CHEMISTRY I.** (3-3-0). This course and BIOL 4360, are a two-part series designed to provide students with an integrated understanding of how biologically important molecules act, interact, and impact living cells. Emphasis is placed on biosynthesis, structure and function of macromolecules; major metabolic and catabolic processes including the enzymes involved, their mechanisms of action, and their regulation; and coordination of the cell's metabolic activities in response to internal and external signals. BIOL 4350 covers biological macromolecules structure and function, and transducing and storing of energy. Prerequisites: BIOL 1010, 1020, 3250, CHEM 1030, 1040, 3010. Co-requisite: BIOL 4351.
- 4351. BIOLOGICAL CHEMISTRY LABORATORY I.** (1-0-3). This is a companion laboratory for BIOL 4350. Prerequisite: registration in or credit for BIOL 4350.
- 4360. BIOLOGICAL CHEMISTRY II.** (3-3-0). This course and BIOL 4350, are a two-part series designed to provide students with an integrated understanding of how biologically important molecules act, interact, and impact living cells. Emphasis is placed on biosynthesis, structure and function of macromolecules; major metabolic and catabolic processes including the enzymes involved, their mechanisms of action, and their regulation; and coordination of the cell's metabolic activities in response to internal and external signals. BIOL 4360 covers the cellular biosynthetic pathways, molecular motors, and drug development. Prerequisite: BIOL 4350. Co-requisite: 4361.
- 4361. BIOLOGICAL CHEMISTRY LABORATORY II.** (1-0-3). This is a companion laboratory for BIOL 4360. Prerequisite: registration in or credit for BIOL 4360.
- 4400. GENERAL ECOLOGY.** (3-3-0). Fundamental ecological principles with reference to ecosystem structure and function and interrelationship among and between living and non-living components of nature. Prerequisite: Registration in or credit for 4401, 1020-1021; junior standing or consent of instructor.
- 4401. GENERAL ECOLOGY LABORATORY.** (1-0-3). Sampling and field methods of measurements of abiotic and biotic factors. Prerequisite: Registration in or credit for 4400 or consent of instructor.
- 4730. CLINICAL HEMATOLOGY AND COAGULATION.** (6-0-0). Normal and diseased blood characteristics, hematopoiesis, anemias, hemoglobinopathies, leukemias, mechanisms of blood coagulation, manual and automated methods of hematology and quality control; performing tests such as complete blood cell counts, red blood cell indices, sedimentation rates, hematocrits, coagulation rates and factor analysis of manual and automated methods.
- 4740. CLINICAL URINALYSIS.** (2-0-0). Renal morphology, physiology, diseases and diagnostic procedures; chemical and microscopic examination of urine.
- 4750. CLINICAL CHEMISTRY.** (8-0-0). Theory and application of chemical analysis of body fluids in normal and disease states; procedures of manual methods, autoanalyzers, chromatography, electrophoresis, toxicology, radioimmunoassay, blood gas analysis, instrument calibration and maintenance, test evaluation and quality control.
- 4760. CLINICAL IMMUNOLOGY AND SEROLOGY.** (2-0-0). Principles of immunology and serology and their application to medical laboratory diagnosis; detecting specific antibodies associated with disease, quality control techniques and interpretation of findings.
- 4770. CLINICAL MICROBIOLOGY.** (7-0-0). Isolation, identification, characteristics, diseases caused, disease mechanisms and methods of control of bacteria, mycobacteria, fungi and animal parasites; manual and automated techniques for isolation and identification of microorganisms.
- 4780. CLINICAL IMMUNOHEMATOLOGY.** (4-0-0). Theory and practice of blood banking. Typing and cross matching blood, donor processing, screening and identification of atypical antibodies, recognition of abnormal tests, quality control procedures, administration and technical operation; typing and cross matching, donor blood selection, detection of abnormal antibodies, blood processing, plasmapheresis, and other blood component fractionation procedures.
- 4790. LABORATORY MANAGEMENT.** (1-0-0). Theory and practice of management of laboratory personnel, education, certification, data, quality control, supplies and interaction with patients, hospital personnel and physicians.
- 4900. UNDERGRADUATE SEMINAR.** (1-0-0). Reports and discussions on current research. May be repeated any number of times, but no more than two hours may be applied toward a B.S. degree.
- 4910. CRITICAL READING.** (1-1-0). This is a senior level course that will train students to search, read, critique, and draw conclusions from the primary scientific literature. Prerequisite: senior status or permission of the instructor.
- 4920. SPECIAL PROBLEMS IN MARINE SCIENCE.** (1 to 4-0-0). Directed undergraduate research and study at a coastal laboratory of the Louisiana Universities Marine Consortium. By arrangement.
- 4930. MICROBIAL PHYSIOLOGY.** (3-3-0). Prokaryotic cell biology will be discussed primarily from physiological and biochemical standpoints with a focus on conceptual understanding, integration, and mechanism. Bioenergetics, cell adhesion, the molecular basis of morphogenesis and differentiation, prokaryotic motility and cellular processes related to environmental stresses. Prerequisites: BIOL 2090 and 2190 or CHEM 3010.
- 4940. PROBLEMS IN BIOLOGICAL SCIENCES.** (1 to 3-0-0). Independent undergraduate research. Requirements include: student-instructor meeting as frequently as needed; presentation of the procedures, results, and conclusions of the project in the form of a research paper. Prerequisites: junior standing; consent of the department head and proposed research director. This course may be repeated any number of times, but no more than 6 hours may be applied toward a B.S. degree. Areas of concentration are identified as follows:
- 01-anatomy
  - 02-animal science: animal care and health
  - 03-animal science: judging techniques
  - 04-animal science: livestock processing
  - 05-animal science: meat operations
  - 06-animal science: nutrition and feeding
  - 07-animal science: production methods
  - 08-animal science: reproduction
  - 09-animal science: selection and evaluation
  - 10-behavior
  - 11-biochemistry
  - 12-botany
  - 13-development
  - 14-entomology
  - 15-fish
  - 16-genetics
  - 17-herpetology
  - 18-immunology
  - 19-invertebrate zoology
  - 20-limnology
  - 21-mammalogy
  - 22-microbiology
  - 23-molecular and cell biology
  - 24-ornithology
  - 25-parasitology
  - 26-physiology
  - 27-wildlife

- 4960. WILDLIFE MANAGEMENT PRACTICUM.** (2-0-0). Work experience with federal, state or private industry concerned with management of natural resources. Required of all wildlife minors and coordinated through departmental faculty and cooperating agency. Written report. Prerequisite: Consent of departmental faculty.
- 4990. CAPSTONE COURSE FOR MICROBIOLOGY.** (3-3-0). A synthesis of previous microbiology lecture and laboratory coursework focused for an individually directed research project. Background research, design of the experiment, conduction of the experiment as well as the communication of results (written and verbal) is the end result of the student's efforts. Accommodations to the above description may be granted upon permission of the Department Head. Prerequisite: senior standing.

## BIOMEDICAL TECHNOLOGY (BMET)

For Undergraduates Only

- 3320. DIGITAL SIGNAL PROCESSING.** (3-3-0). Overview of medical equipment networking and telecommunications. Digital signal processing. Digital image processing systems. Prerequisites: Electronics Engineering Technology 3360-3361, credit for or registration in Electronics Engineering Technology 3310-3311.
- 3321. DIGITAL SIGNAL PROCESSING LABORATORY.** (1-0-2). Prerequisite: Credit for or registration in 3320.
- 3370. BIOMEDICAL INSTRUMENTATION.** (3-3-0). Introduction to electronic acquisition and analysis of biomedical signals and imaging; biomedical transducers and actuators; signal conditioning; instrumentation amplifiers; characteristics, practical design, testing, and applications of electronic biomedical measuring instruments. Prerequisites: 3320-3321, Electronics Engineering Technology 3310-3311.
- 3371. BIOMEDICAL INSTRUMENTATION LABORATORY.** (1-0-2). Prerequisite: Credit for or registration in 3370.
- 4950. BIOMEDICAL ENGINEERING TECHNOLOGY INTERNSHIP.** (3 to 6-0-0). This course, along with Electronics Engineering Technology 4940, is the capstone experience for students in the biomedical concentration within the Electronics Engineering Technology program. Students will complete no fewer than 180 hours of student internship. Students must complete periodic evaluations, special projects, and a final report. Prerequisites: 3370, 3371, Electronic Engineering Technology 4300, 4301, 4940, English 3230, and senior status.

## BUSINESS ADMINISTRATION (BUAD)

For Undergraduates Only

- 1010. BUSINESS DOCUMENT PREPARATION.** (3-3-0). Introduction to the use of productivity software in the creation of business related documents; the use of language arts skills in the production of business related documents and the development of appropriate keying skills. Students majoring in the four-year business degree (computer information systems, accounting or business administration) may not use this course as a business elective.
- 1020. ADVANCED BUSINESS DOCUMENT PREPARATION.** (3-3-0). Advanced use of productivity software in the preparation of more complex business documents, legal documents, medical documents, and foreign correspondence. This course is for undergraduates only. Students majoring in the four-year business degree (computer information systems, accounting or business administration) may not use this course as a business elective. Prerequisite: BUAD 1010.
- 1040. FUNDAMENTALS OF BUSINESS ENTERPRISE.** (3-3-0). The American business system; business organization and management; finance; marketing; government regulation of business.
- 1800. INTRODUCTION TO INFORMATION TECHNOLOGY.** (3-3-0). An introductory course, focusing on the use of file management; word processing, presentation, and data base management; and social issues related to information technologies.
- 2120. BASIC BUSINESS STATISTICS.** (3-3-0). A basic statistical foundation is developed; emphasis is then placed upon practical business applications including hypothesis testing, ANOVA, contingency table analysis, and introductory regression analysis; material is related directly to business applications. Prerequisite: CIS 2000 and any of the following: Mathematics 1060, 1090, 1100, 1810, 2010 or SMAT 1820 and 1840, or 2810.
- 2140. APPLIED OFFICE PROCEDURES.** (3-3-0). An office practice course to integrate keyboarding, computer applications, office management and clerical skills through the use of actual business procedures; lecture and laboratory practice designed to develop good business judgment and initiative. Prerequisites: 1020, 2200, Business Administration 1800; or consent of instructor.
- 2180. OFFICE PRODUCTIVITY SOFTWARE I.** (3-3-0). Review of Windows Operating System file management tasks. Emphasizes applications of common office productivity software including Word, Excel, Access, PowerPoint, and Outlook. Course is designed to assist students in preparation for one or more of the MCAS (Microsoft Certified Application Specialist) tests for certification.
- 2190. OFFICE PRODUCTIVITY SOFTWARE II.** (3-3-0). Emphasizes advanced applications and data exchange between programs of office productivity software suites, including Word, Excel, Access, PowerPoint, and Outlook. Course is designed to assist students in preparation for one or more of the MCAS (Microsoft Certified Application Specialist) tests for certification. Prerequisite: BUAD 2180 or consent of instructor.
- 2200. BUSINESS REPORTS AND COMMUNICATION.** (3-3-0). Communication problems, business letters, employment application procedures. Problem areas investigated by research procedures; sources of data, compilation and arrangement of data, documentation, bibliography, and effective presentation. Prerequisite: Business Administration 1800 or equivalent, English 1010, 1020.
- 2250. LEGAL ESSENTIALS FOR SMALL BUSINESSES.** (3-3-0). Legal aspects of buying and owning a small business in Louisiana, including the bulk sales act, workmen compensation, employer-employee relationships, bankruptcy, and property rights. Considers mainly Louisiana law.
- 3120. INTERMEDIATE BUSINESS STATISTICS.** (3-3-0). Time series, index numbers, analysis of variances, chi square, non-parametric tests applied to business and economic problems. Prerequisite: Successful completion of Business Administration 2120 or SSTA 2810 and junior standing.
- 3250. BUSINESS LAW I.** (3-3-0). The study of the legal environment of Business, with an emphasis on the development of law, an overview of the court system, legal concepts underlying business crimes and torts, contracts, employer-employee relationships, commercial paper, and property rights, ethics. Prerequisite: Junior standing.
- 3260. BUSINESS LAW II.** (3-3-0). Legal concepts underlying the areas of sales, creditors rights, secured transactions, bankruptcy, business organizations including sole proprietorships; review of the UCC, and ethics. Partnerships, and corporations, agencies, lenders and director's liability, and accountants' liability. Prerequisite: Junior standing.
- 3270. INTERNATIONAL BUSINESS.** (3-3-0). Pertinent dimensions of the global business environment. Focusing on the international aspects of management, marketing, finance, accounting and economics. Various theories related to global business will be presented and applied in the form of cases.