BIOLOGY (BIOL)

BIOL-COMP Senior Comprehensive Exam
(NULL credits) (Both Fall & Spring Semesters)
Senior Comprehensive Examination (cr)

BIOL-1105 Plants & Civilization
(4 credits) (Spring Semester)
Plants and Civilization (4) (S) This course is an introductory, non-majors, course that focuses on the complex relationships between human society and plants. Students explore scientific discoveries in agriculture, crop domestication, and medicine, as well as the aesthetic and cultural value of plants across time and geography. There are three class meetings and one lab period each week. (NW, SM)
General Education Categories: Scientific Method, Understanding the Natural World

BIOL-1107 Principles of Biology
(4 credits) (Both Fall & Spring Semesters)
Principles of Biology (4) (B) This course is a general introduction to the principles and foundations of life science. It is designed to meet the needs of a student not majoring in a scientific discipline. It attempts to convey the concepts and methods involved in scientific approaches to problems in the context of the world of living things. Do not enroll in this course if your intended major is in any way related to biology or health-related fields. There are three class meetings and one lab period each week. (NW, SM)
General Education Categories: Scientific Method, Understanding the Natural World

BIOL-1121 General Biology I
(5 credits) (Fall Semester)
General Biology I (5) (F) This course is a study of the principles of the life sciences emphasizing the essential unity of basic vital phenomena of all organisms with emphasis on humans. Students learn to conduct, evaluate, and present research in a biology laboratory setting. Topics include: the scientific method, qualitative and quantitative observations, sampling techniques, collecting, recording, summarizing, graphically presenting data, and labora-tory report writing. The course includes a detailed study of living structures and their functions examined at the levels of organs, cells, and molecules plus classical genetics, molecular genetics, embryogenesis, microbiology, and immunology. There are four class meetings/discussion and one lab period each week. (NW, SM)
General Education Categories: Scientific Method, Understanding the Natural World

BIOL-1122 General Biology II
(4 credits) (Spring Semester)
General Biology II (4) (S) This is a continuation of BIOL-1121, covering the diversity of living organisms, ecology and animal behavior. There are three class meetings and one lab period each week. (NW)
General Education Categories: Understanding the Natural World

BIOL-2242 Human Anatomy & Physiology I
(4 credits) (Fall Semester)
Human Anatomy and Physiology I (4) (F) This is an integrated study of the structure and basic principles involved in the structure and functions of the human organism. There are three class meetings and one lab period each week. Note: This course is specifically intended only for those students interested in pursuing a career in athletic health care, nursing, or other allied health professions.

BIOL-2243 Human Anatomy & Physiology II
(4 credits) (Spring Semester)
Human Anatomy and Physiology II (4) (S) This is the second half of an integrated study of the structure and basic principles involved in the functions of the human organism. There are three class meetings and one lab period each week. Note: This course is specifically intended only for those students interested in pursuing a career in athletic health care, nursing, other allied health professions. (NW)
General Education Categories: Understanding the Natural World

BIOL-2260 Principles of Microbiology
(4 credits) (Spring Semester)
Principles of Microbiology (4) (S) This course examines viral and bacterial growth, reproduction, cell structure, function, and the basics of genetics. Measures used to control microbial growth will also be discussed, including antibiotics, disinfection, and sterilization. We will also be looking at the basics of how we interact with microorganisms with an introduction to immunology. This course includes a laboratory component. There are four class meetings/discussions and a lab period each week. Note: This course fulfills a prerequisite for entry into the Nursing program at Benedictine College.
Prerequisite(s): Successful completion (C or better) in BIOL-1121.

BIOL-3305 Biological Statistics
(4 credits) (Spring Semester)
Biological Statistics (4) (S) This course provides students with theoretical and applied knowledge to plan, conduct, statistically analyze, interpret, evaluate, and present biological research. Topics include: the scientific method; design of effective research constructs; qualitative and quantitative observations; sampling techniques; collecting, recording, summarizing, statistically analyzing, and graphically and orally presenting data; coding in statistical software; writing in the scientific style; and reading and critiquing scientific literature. Lecture: three hours. Laboratory: three hours. (OC, VC)
Prerequisite(s): Successful completion (C or better) of BIOL-1121, BIOL-1122.
General Education Categories: Oral Communication, Visual Communication

BIOL-3310 Biology III- Mechanisms of Evolution
(3 credits) (Spring Semester)
Mechanisms of Evolutionary Change (3) (F) This course is intended to provide a scientific explanation for the change that occurred and continues to occur in the natural world. Topics include: historical and philosophical development of evolutionary thought; small scale and large scale processes of evolutionary change; results of the evolutionary process.
Prerequisite(s): Successful completion (C or better) of BIOL-1121 and BIOL-1122.

BIOL-3312 Plant Biology
(4 credits) (Discretion of Department)
Plant Biology (4) (D) A study of the form, structure, and function of the flowering plants, followed by a systematic survey of other plant groups with special reference to reproductive habits, evolution, and ecological relationships. There are three class meetings and a lab period each week.
Prerequisite(s): Successful completion (C or better) in BIOL-3305,BIOL-3310, and CHEM-1210.

BIOL-3313 Taxonomy of Flowering Plants
(4 credits) (Discretion of Department)
Taxonomy of Flowering Plants (4) (D) This course involves a systematic survey of plant families with an emphasis on plants of northeast Kansas and the Benedictine Bottoms. There are three class meetings and a lab period each week.
Prerequisite(s): Successful completion (C or better) in BIOL-3305,BIOL-3310, and CHEM-1210.

BIOL-3345 Developmental Biology
(4 credits) (Discretion of Department)
Developmental Biology (4) (D) This course examines the major events occurring in the embryological development of animals. Recent experimental findings concerning the initiation and regulation of animal development at the molecular, cellular and tissue level will be considered. Related topics include: human development, cancer and aging. The development of vertebrates is examined in detail in the laboratory. Students also design and conduct experiments elucidating the processes and mechanisms of development. There are three class meetings and a lab period each week.
Prerequisite(s): Successful completion (C or better) in BIOL-3305,BIOL-3310, and CHEM-1210.

BIOL-3346 Comparative Vertebrate Anatomy
(4 credits) (Discretion of Department)
Comparative Vertebrate Anatomy (4) (D) This is a comparative study of the nine major organ systems found in vertebrate animals with considerations of human systems. Evolutionary and functional aspects of anatomical differences among vertebrate groups are emphasized. The laboratory work primarily involves dissection and identification of anatomical structures found in fish and mammals. Where appropriate, amphibians, reptiles and birds are also examined. There are two class meetings and two lab periods each week.
Prerequisite(s): Successful completion (C or better) in BIOL-3305,BIOL-3310, and CHEM-1210.

BIOL-3347 Kansas Vertebrates Natural History
(4 credits) (Discretion of Department)
Kansas Vertebrates Natural History (4) (D) This course facilitates a greater awareness of and appreciation for the diversity of vertebrate species (fishes, amphibians, reptiles, birds, and mammals). The field component builds upon the broader framework established in the classroom to develop taxonomic skills, knowledge of specific life history strategies, and insight into the habitat requirements of vertebrate species within the major local physiographic provinces of Kansas. Field trip attendance is mandatory and students will work outside for extended periods of time in winter and spring conditions. There are two class meetings and two lab periods each week.
Prerequisite(s): Successful completion (C or better) in BIOL-3305,BIOL-3310, and CHEM-1210.

BIOL-3353 Invertebrate Biology
(4 credits) (Discretion of Department)
Invertebrate Biology (4) (D) This is a broad study of the classification, structure, and natural history of invertebrates from protozoans through the lower chordates. Laboratory and field studies will closely examine the form and function of the major invertebrate groups and habitats in which they occur. Special attention will be given to those invertebrate groups that occur in central North America. There are two class meetings and two lab periods each week.
Prerequisite(s): Successful completion (C or better) in BIOL-3305,BIOL-3310, and CHEM-1210.

BIOL-3354 Animal Behavior
(4 credits) (Discretion of Department)
Animal Behavior (4) (D) The study of the evolution, development, causation, and function of the behavior of animals are covered in this course. Emphasis will be given to the biological mechanisms and adaptive significance of the behavior of both invertebrates and vertebrates. There are three class meetings and a lab period each week.
Prerequisite(s): Successful completion (C or better) in BIOL-3305,BIOL-3310, and CHEM-1210.

BIOL-3355 Ecology
(4 credits) (Discretion of Department)
Ecology (4) (D) An introduction to the principles underlying the interrelationship of organisms and their environment. Topics include: ecosystem structure, community organization, and population parameters. Field studies and analysis of data are an integral part of the course. There are three class meetings and a lab period each week.
Prerequisite(s): Successful completion (C or better) in BIOL-3305,BIOL-3310, and CHEM-1210.

BIOL-3360 Microbiology
(4 credits) (Discretion of Department)
Microbiology (4) (D) This is an introduction to microorganisms: their morphology, taxonomy, physiology and genetics, together with a survey of their pathogenicity and immunology. The fundamental principles are investigated in correlated laboratory experiments. There are three class meetings and a lab period each week. Successful completion (C or better) in BIOL-3305 and BIOL-3310.
Pre or Corequisite(s): CHEM-2200 or BIOL-3370.

BIOL-3370 Genetics
(4 credits) (Discretion of Department)
Genetics (4) (D) Transmission and molecular genetics of prokaryotes and eukaryotes are presented in this course as foundational principles and lines of inquiry that span all levels of biological organization. There are three class meetings and a lab period each week.
Prerequisite(s): Successful completion (C or better) in BIOL-3305, BIOL-3310, and CHEM-1210.

BIOL-3380 Ornithology
(4 credits) (Discretion of Department)
Ornithology (4) (D) The lecture component of this course covers the evolution, ecology, physiology, and conservation of birds. Topics to be covered include anatomy and physiology, flight and migration, behavior, reproduction and life history, current threats to populations, and conservation and management strategies. The lab component focuses on the anatomy of birds, studies of feathers, and identification of museum skin specimens. The field component of the course includes trips to nearby birding hotspots and will incorporate the use of spotting scopes, binoculars, live capture of birds using mist nets, bird banding, and collection of morphometric data in a field setting.

BIOL-4457 Methods of Teaching Secondary Science
(2 credits) (Both Fall & Spring Semesters)
Methods of Teaching Secondary Science (2) (B) This course acquaints the student with special techniques, current technologies in teaching strategies, and devices for teaching the natural sciences and evaluating student progress in the classroom and laboratory; the planning and presentation of laboratory work and material; the use and maintenance of equipment, and the selection and purchase of laboratory supplies. Some consideration will be given to the journals, handbooks, and other technical literature useful in teaching science. Lecture: two hours.

BIOL-4475 Molecular & Cell Biology
(4 credits) (Discretion of Department)
Molecular and Cell Biology (4) (D) This course is a basic introduction to the molecular biology of the cell. Lectures include a brief review of fundamental cell chemistry, followed by more comprehensive discussion of membrane and organelle structure and function, protein synthesis and structure, cell movement, signaling and regulation, the cell cycle, and cancer. Some time is devoted to DNA and RNA replication and function and energy utilization. Laboratories involve various current techniques used to investigate these topics. There are three class meetings and a lab period each week. Prerequisite or corequisite: CHEM-2200.
Prerequisite(s): Successful completion (C or better) in BIOL-3305 and BIOL-3310.

BIOL-4476 Immunology
(4 credits) (Discretion of Department)
Immunology (4) (D) This course involves lectures on the nature and mechanisms of natural and acquired resistance including cellular and humoral immunity. The characteristics of antigens and antibodies, their interaction, the ontogeny and cellular basis of the immune response, hypersensitivity (allergy), tolerance, and biotechnological applications will be discussed. The laboratory is designed to demonstrate immunological phenomena and give the student an opportunity to develop familiarity with immunological techniques. There are three class meetings and a lab period each week. Prerequisite or corequisite: CHEM-2200.
Prerequisite(s): Successful completion (C or better) in BIOL-3305 and BIOL-3310.

BIOL-4482 Animal Physiology
(4 credits) (Discretion of Department)
Animal Physiology (4) (D) Life processes: receptor, neuron, and muscle activities, membrane permeability and transport, hormonal control, gas exchange, metabolism, osmoregulation, excretion, secretion, and circulation studies in invertebrates, vertebrates, and humans are covered in this course. There are three class meetings and a lab period each week. Prerequisite or corequisite: CHEM-1210.
Prerequisite(s): Successful completion (C or better) in BIOL-3305 and BIOL-3310.

BIOL-4484 Cell Physiology
(4 credits) (Discretion of Department)
Cell Physiology (4) (D) This course is designed to develop students' knowledge of human cell physiology. It provides an understanding of how individual cells respond to the environment to affect the tissues, organs, and organ systems of the human organism. It will include topics such as membrane transport, cell-cell adhesion, sensory transduction, neurophysiology, cardiovascular physiology, renal physiology, muscle physiology, gas exchange and transport, and endocrinology. It will focus on normal function and the maintenance of homeostasis, as well as how dysfunction can lead to human disease. There are three class periods and a lab period each week. Prerequisite or corequisite: CHEM-2200.
Prerequisite(s): Successful completion (C or better) in BIOL-3305 and BIOL-3310.

BIOL-4486 Research
(1 credit) (Discretion of Department)
Research (1-3) (D) Independent investigation of a biological problem in consultation and/or collaboration with a faculty member. Consent of instructor required.
Prerequisite(s): CHEM-1210.