

BIOLOGY

BIOL 101 (4 cr hrs)

Introductory Botany

This course examines the foundation principles of biology with special emphasis on anatomy, morphology, life cycles, reproduction, evolution and diversity of plants and related organisms. Both lecture and laboratory are required for this course.

Generals Studies Outcome: Methods of Inq & Explanatory Schema - Nat Science

BIOL 102 (4 cr hrs)

Introductory Zoology

This course examines the foundation principles of biology with special emphasis on anatomy, morphology, life cycles, reproduction, evolution and diversity of animals and related organisms. Both lecture and laboratory are required for this course.

Generals Studies Outcome: Methods of Inq & Explanatory Schema - Nat Science

BIOL 130 (4 cr hrs)

General Biology

An integrated course designed to introduce the basic patterns and processes of biology and the scientific method. The course builds a conceptual understanding of major biological problems and opportunities and the role the biological sciences play in understanding and solving these problems and exploiting opportunities. Major topics include: medicine, epidemiology and disease; applied evolution and ecology; genetic engineering, cloning and biotechnology; population growth and the role of demographics in energy and economic development, and other relevant current topics as appropriate. This is a course for non-majors and cannot be used for elective credit in the Natural Science major. Both lecture and laboratory are required for this course.

Generals Studies Outcome: Methods of Inq & Explanatory Schema - Nat Science

BIOL 150 (4 cr hrs)

Biodiversity

Is an introductory, non-majors, internet-delivered laboratory course in the Natural Sciences. The course examines the diversity of living organisms with an emphasis on taxonomy and classification, life history, and evolution. The course covers the five major kinds of organisms (bacteria, fungi, plants, protists, animals) and the major subdivisions within each. Laboratory is required and involves investigations, observations, and other activities by students on their own time.

Generals Studies Outcome: Methods of Inq & Explanatory Schema - Nat Science

BIOL 210 (4 cr hrs)

Human Anatomy

A comprehensive examination of the cell biology, histology, and organ systems of humans. The course is designed for students in allied health and pre-nursing. Both lecture and laboratory are required for this course.

Prerequisite Required: BIOL 102

Generals Studies Outcome: Methods of Inq & Explanatory Schema - Nat Science

BIOL 220 (3 cr hrs)

Horticulture and Plant Propagation Techniques

Students learn the foundation aesthetic, maintenance and propagation techniques of horticulture in this course. Emphasis is placed on plant propagation techniques and horticultural practices for plant species suited for successful gardening in Nebraska. Both lecture and laboratory are required for this course.

Prerequisite Required: BIOL 101

Generals Studies Outcome: Methods of Inq & Explanatory Schema - Nat Science

BIOL 225 (3 cr hrs)**Freshwater Biology**

This course examines the biology of lakes and streams, focusing on the diversity, assembly, and interactions of macrobiotic communities. Both lecture and laboratory are required for this course.

Prerequisite Required: BIOL 102

Generals Studies Outcome: Methods of Inq & Explanatory Schema - Nat Science

BIOL 301 (4 cr hrs)**Microbiology**

An introduction to the biology of prokaryotic, eukaryotic, and viral microbes; the diseases associated with microbes; and basic microbiology lab techniques. Both lecture and laboratory are required for this course.

Prerequisites Required: BIOL 101 and BIOL 102, or BIOL 210

Generals Studies Outcome: Methods of Inq & Explanatory Schema - Nat Science

BIOL 311 (3 cr hrs)**Evolution and Systematic Biology**

Evolution is the core theory of modern biology and all biology depends upon a robust systematic hypothesis of evolutionary relationship among organisms. This course presents the fundamental concepts of the modern Evolutionary Synthesis: adaptation, niche and population variation; microevolution; speciation and species isolation; systematic theory; phenetic and phylogenetic classification; and zoological nomenclature.

Prerequisites Required: BIOL 101, BIOL 102

Generals Studies Outcome: Methods of Inq & Explanatory Schema - Nat Science

BIOL 312 (4 cr hrs)**Human Physiology**

An examination of the functions and interactions of the organ systems of the human body with an emphasis on the body's homeostatic control mechanisms. Both lecture and laboratory are required for this course.

Prerequisites Required: BIOL 102, BIOL 210

Generals Studies Outcome: Methods of Inq & Explanatory Schema - Nat Science

BIOL 315 (3 cr hrs)**Introductory Immunology**

This class is intended to provide students with basic concepts on the subject of immunology. The course will introduce students to defense mechanism of the body and nomenclature of immunology as well as the components of innate and adaptive immune responses. Students learn and appreciate the broad area of immunology and its importance as a frontier discipline of biomedical sciences. Students will understand types of immune responses and their general properties.

Prerequisites Required: CHEM 102 and BIOL 102

Generals Studies Outcome: Methods of Inq & Explanatory Schema - Nat Science

BIOL 317 (4 cr hrs)**Ecology**

The interactions among organisms and environment are studied in this course including major foci on ecology of the individual, population ecology, and community ecology. Both lecture and laboratory are required for this course.

Prerequisites Required: BIOL 101, BIOL 102

Generals Studies Outcome: Methods of Inq & Explanatory Schema - Nat Science

BIOL 330 (3 cr hrs)**Cellular Biology**

Cellular Biology is an interdisciplinary class administered jointly by the Chemistry and Biology departments. The class is intended to provide the students with a detailed look at the organization and the chemistry of living cells. The course will teach students to understand and appreciate cellular structure and function through the understanding of structure in molecular terms and function in terms of chemical reactions and events.

Prerequisites Required: CHEM 102 and BIOL 102

Generals Studies Outcome: Methods of Inq & Explanatory Schema - Nat Science

BIOL 340 (3 cr hrs)**Virology**

This course will provide students with a basic conceptual understanding of virology and the effects of viruses on human health. Students will learn and understand the structure, function, and nomenclature of viruses as well as role of viruses as disease agents for humans and other living organisms. Students will understand and appreciate the broad scope of virology and its importance as a biomedical science including the role of viruses in emerging infectious disease.

Prerequisites Required: BIOL 301 and 330

Generals Studies Outcome: Methods of Inq & Explanatory Schema - Nat Science

BIOL 350 (3 cr hrs)**Conservation and Management**

This course examines the role of density dependent and density independent population limiting factors on the persistent and growth of wildlife populations. Sources and impacting factors on metapopulations, species persistence, and biodiversity are examined from an ecological and wildlife management perspective.

Prerequisites Required: BIOL 101, BIOL 102

Generals Studies Outcome: Methods of Inq & Explanatory Schema - Nat Science

BIOL 355 (3 cr hrs)**Wildlife Techniques**

This is a laboratory and field-based examination of contemporary techniques for monitoring, sampling, and evaluating the health, size, and persistence of wildlife populations and overall community and ecosystem health.

Generals Studies Outcome: Methods of Inq & Explanatory Schema - Nat Science

BIOL 360 (3 cr hrs)**Animal Behavior**

A survey of the evolutionary, genetic, physiological, and ecological bases of animal behavior.

Prerequisites Required: BIOL 101, BIOL 102

Generals Studies Outcome: Methods of Inq & Explanatory Schema - Nat Science

BIOL 365 (4 cr hrs)**Entomology: the Natural History of Great Plains Insects**

Insects are numerically, taxonomically, and volumetrically the dominant life forms on Earth. This course provides an introduction to insect diversity, evolution, ecology, taxonomy, development, and physiology through a study of the natural history of common Great Plains insects. Both lecture and laboratory are required for this course.

Prerequisite Required: BIOL 102

Generals Studies Outcome: Methods of Inq & Explanatory Schema - Nat Science

BIOL 370 (4 cr hrs)**Natural History of Invertebrates**

This course examines invertebrate community relationships, diversity, and structure. The course stresses field-based observation of community components, natural history, and invertebrate interactions in 4 representative invertebrate communities. Emphasis is placed on representatives in the Great Plains and Nebraska.

Prerequisites Required: BIOL 101, BIOL 102

Generals Studies Outcome: Methods of Inq & Explanatory Schema - Nat Science

BIOL 380 (4 cr hrs)**Invertebrate Zoology**

This course is a comprehensive survey of the structure, classification, ecology and evolutionary relationships of invertebrate animals. Primary focus is placed on the comparative anatomy and evolution of major invertebrate phyla. Both lecture and laboratory are required for this course.

Prerequisites Required: BIOL 101, BIOL 102

Generals Studies Outcome: Methods of Inq & Explanatory Schema - Nat Science

BIOL 385 (3 cr hrs)**Disease and Epidemiology**

This course examines historical and contemporary topics relevant to understanding how disease is manifested at multiple levels of organization (organismal, population, and ecosystem). Case studies from the primary and secondary literature will elucidate topics including (but not limited to): intra-host effects (pathogenesis, resistance, immunity); animal-human interactions (zoonoses; emerging diseases); disease spread and control (epidemiological models, treatment regimens, control measures); environmental science and disease (disease and biodiversity, ecosystem degradation, and in wildlife and agricultural systems); and evolution of host-pathogen relationships. Examples will be drawn from viral, bacterial, protozoological, helminthological, and non-transmissible diseases.

Prerequisites Required: BIOL 101, BIOL 102

Generals Studies Outcome: Methods of Inq & Explanatory Schema - Nat Science

BIOL 398 (4 cr hrs)**Human Parasitology**

The morphology, ecology, epidemiology, and evolution of parasites are studied in this laboratory course. Emphasis is placed on the diagnosis, course of infection, and clinical pathology of important human internal parasites. Both lecture and laboratory are required for this course.

Prerequisites Required: BIOL 101, BIOL 102

Generals Studies Outcome: Methods of Inq & Explanatory Schema - Nat Science

BIOL 404 (3 cr hrs)**Genetics**

This course provides an introduction to molecular, cellular, organismal, developmental and population genetics.

Prerequisites Required: BIOL 101, BIOL 102

Generals Studies Outcome: Methods of Inq & Explanatory Schema - Nat Science

BIOL 405 (3 cr hrs)**Histology and Biological Microtechnique**

The preparation, curation, and microscopic anatomy of animal and plant tissues are studied in this course. Topics include histological microtechnique, specimen fixation, differential staining and preparation of permanent mounts of whole and sectioned materials.

Prerequisite Required: BIOL 102

Generals Studies Outcome: Methods of Inq & Explanatory Schema - Nat Science

BIOL 407 (4 cr hrs)**Developmental Biology**

This course is a study of the mechanisms of development in plants and animals. Both lecture and laboratory are required for this course.

Prerequisites Required: BIOL 101, BIOL 102

Generals Studies Outcome: Methods of Inq & Explanatory Schema - Nat Science

BIOL 409 (3 cr hrs)**Advanced Ecology**

The interactions among organisms and environment are studied in this course including major foci on the role of genetics and adaptation on persistence and colonization by populations as well as the effects of landscape and spatial scale on the ecology of the individual, metapopulation, and community.

Prerequisite Required: BIOL 317

Generals Studies Outcome: Methods of Inq & Explanatory Schema - Nat Science

BIOL 412 (3 cr hrs)**Experimental Biology**

Students will conceive, design and conduct a self-contained experimental research project in biology. The resulting data and conclusions will be reported in the form of a platform presentation and a technical manuscript. This is a capstone course for the Biological Science option and includes a student senior competency defense.

Prerequisites Required: For Juniors & Seniors Only, BIOL 101 and BIOL 102

Generals Studies Outcome: Methods of Inq & Explanatory Schema - Nat Science

BIOL 414 (1 cr hrs)**Internship in Wildlife Management**

This program allows wildlife students to gain relevant work experience and establish professional relationships in their field of specialty. Students may enroll for 1-12 hours of graded credit. A minimum of forty hours of work experience will be required for every hour of credit per semester. The student will complete necessary paperwork with employer and Wildlife Internship Coordinator. The student's work will be supervised and evaluated by the Wildlife Internship Coordinator in cooperation with the employer. This is a capstone course for the Wildlife Ecology option and includes a student senior competency defense. Arranged.

Generals Studies Outcome: Methods of Inq & Explanatory Schema - Nat Science

BIOL 420 (4 cr hrs)**Comparative Anatomy and Evolution of the Vertebrates**

The evolutionary rise and diversification of vertebrates is studied through a detailed analysis of comparative anatomical design among major vertebrate taxa in lecture and the use of comparative anatomical dissection technique in laboratory. Both lecture and laboratory are required for this course.

Prerequisites Required: BIOL 101, BIOL 102

Generals Studies Outcome: Methods of Inq & Explanatory Schema - Nat Science

BIOL 422 (4 cr hrs)**Biology of the Ectotherms: Ichthyology and Herpetology**

This course examines the fishes, amphibians, and reptiles from taxonomic, physiological, ecological and evolutionary perspectives. Emphasis is placed on representatives in the Great Plains and Nebraska. Both lecture and laboratory are required for this course.

Prerequisites Required: BIOL 101, BIOL 102

Generals Studies Outcome: Methods of Inq & Explanatory Schema - Nat Science

BIOL 424 (4 cr hrs)**Biology of the Endotherms: Mammalogy and Ornithology**

The taxonomy, systematics, anatomy, physiology, reproduction and ecology of birds and mammals are studied in this course, with an emphasis on common species of Nebraska and the Midwest. Both lecture and laboratory are required for this course.

Prerequisites Required: BIOL 101, BIOL 102

Generals Studies Outcome: Methods of Inq & Explanatory Schema - Nat Science

BIOL 426 (4 cr hrs)**Vertebrate Diversity**

This course examines the biodiversity, natural history, physiological, and evolutionary relationships among classes of vertebrate animals. Students will compare and contrast patterns and processes in these groups, with an emphasis on the local and regional fauna. Both lecture and laboratory are required for this course.

Prerequisites Required: BIOL 101, BIOL 102

Generals Studies Outcome: Methods of Inq & Explanatory Schema - Nat Science

BIOL 490 (3 cr hrs)**Undergraduate Research Thesis**

Type I and Type II thesis options are available and are completed in close cooperation with a faculty mentor. Type I Option: the student will conceive, design and conduct an independent experimental research project in natural science. The resulting data and conclusions will be reported in the form of a platform presentation to a professional society and/or a technical manuscript submitted for review/publication in a professional scientific journal. Type II Option: the student will conceive, design and conduct an independent review of the technical literature on a specific topic in natural science. The resulting literature review and synthesis will be reported in the form of a platform presentation to a professional society and/or a technical manuscript submitted for review/publication in a professional scientific journal. This is a capstone course for the Biological, Wildlife or Biochemical Science options and includes a student senior competency defense. Arranged.

Generals Studies Outcome: Methods of Inq & Explanatory Schema - Nat Science

BIOL 495 (0 cr hrs)
Senior Competency Exam
Prerequisite Required:

Seniors Only