

Biology (BIOL)

BIOL 1106 Biology for Science Maj Lab I **1 SCH (0-3)**

A laboratory experience that focuses on laboratory techniques, data collection and analysis. The experience reinforces and promotes an understanding of the cell structure, energy transformation, reproduction and genetic variability. Concurrent enrollment in BIOL 1306 recommended.

Fee: \$20.00

BIOL 1107 Biology for Science Maj Lab II **1 SCH (0-3)**

Experimental and observational techniques used to study plant and animal life at the organismal, population and community levels including morphology, physiology, reproduction and ecology. Concurrent enrollment in BIOL 1307 recommended.

Fee: \$20.00

BIOL 1306 Biology for Science Majors I **3 SCH (3-0-1)**

Survey of contemporary biology that covers the chemical basis of life, structure, function and physiology of the cell, molecular biology and microevolution. Three lecturer hours and one discussion hour a week for one semester. Concurrent enrollment in BIOL 1106 recommended.

BIOL 1307 Biology for Science Majors II **3 SCH (3-0-1)**

Continuation of a two-semester course in biological concepts; will emphasize organismal diversity and comparative anatomy, reproduction, physiology, ecology, behavior and evolution. Three lecture hours and one discussion hour a week for one semester. Concurrent enrollment in BIOL 1107 recommended. Prerequisite: BIOL 1306.

BIOL 2375 Life Science **3 SCH (3-2)**

A survey of the basic concepts of biology. Emphasizes cell structure, energy transformation, plant and animal structures and functions, diversity, and classification.

Fee: \$5.00

BIOL 2401 Anatomy and Physiology I **4 SCH (3-3)**

Gross and microscopic anatomy and physiology of the cells and tissues, integument, skeletal, muscular and nervous systems. Six hours of chemistry recommended.

Fee: \$20.00

BIOL 2402 Anatomy and Physiology II **4 SCH (3-3)**

Gross and microscopic anatomy and physiology of the circulatory, respiratory, digestive, excretory, endocrine and reproductive systems. Prerequisites: BIOL 2401; 6 hours of chemistry recommended.

Fee: \$20.00

BIOL 2406 Intermediate Botany **4 SCH (3-3)**

Survey of the principles of the biology of plants, emphasizing structure, function, physiology, development, diversity, evolution, ecology and major plant phyla. Building on foundational concepts from the prerequisite biology sequence, this intermediate-level course examines evolutionary sequences and the relationship between structure and function at succeeding levels of organization from cell, organism, population to community. Correlated lectures, laboratories, discussions and field trips. Prerequisites: BIOL 1307 and BIOL 1107.

BIOL 2420 Principles of Microbiology **4 SCH (3-3)**

Introduction to the fundamentals of microbes with an emphasis on microbe diversity, physiology, and morphology including principles of disinfection, sterilization, immunity, and pathogenicity. This class is intended for nursing, veterinary technician, nutrition, kinesiology, or biology programs. It cannot be substituted for BIOL 2421. Prerequisites: BIOL 1306 and BIOL 1106 or BIOL 2401 and BIOL 2402. Fee: \$6.00

Fee: \$20.00

BIOL 2421 Elementary Microbiology **4 SCH (3-3)**

Fundamental principles of the relationship of microorganisms to the life of human beings, including their morphology, growth, nutrition, and study. Prerequisites: C or better in both BIOL 1306 and BIOL 1106; 6 hours of chemistry recommended.

Fee: \$20.00

BIOL 2450 Intermediate Zoology **4 SCH (3-3)**

Survey of animal biology emphasizing diversity, structure, function, ecology, and evolution. Building on foundational concepts from the prerequisite biology sequence, this intermediate-level course examines major animal phyla with focus on comparative anatomy, physiology, behavior, reproduction, and evolutionary relationships. Laboratory work centers on comparative dissection of representative taxa to investigate anatomical patterns and adaptations across animal groups. Prerequisites: BIOL 1307 and BIOL 1107.

BIOL 3301 Evolutionary Theory **3 SCH (3-0)**

A study of evolutionary theory, mechanisms of evolutionary change and a history of life in the context of contemporary biology. Prerequisite: 12 semester hours of biology are required.

BIOL 3402 Genetics **4 SCH (3-0-3)**

Fundamental concepts of heredity, including cell reproduction, transmission genetics, biochemistry of genetics, gene structure and function and genetics of population. Lecture and recitation meetings. Prerequisites: 12 semester hours of biology; 6 semester hours of chemistry recommended.

BIOL 3403 Plant Taxonomy 4 SCH (3-3)

An introductory course concerned with developing skill in recognition and identification of seed plants at the species and family levels. Emphasis will be placed on collection, use of keys and manuals and herbarium techniques. Prerequisite: 12 semester hours of biology.

Fee: \$20.00

BIOL 3407 Ecology 4 SCH (3-3)

Examines how organisms interact with their environments. Topics include evolution, adaptation, population dynamics, species interactions, and biodiversity conservation. Students gain hands-on experience with ecological concepts, field methods, data analysis, and geo-spatial tools and through lectures, labs, fieldwork, and research to investigate biodiversity, species distribution, and human impacts on ecosystems. Prerequisite: 12 semester hours of biology, including BIOL 1307 and BIOL 1107.

Fee: \$20.00

BIOL 3408 Animal Physiology 4 SCH (3-3)

A study of the fundamental process of the animal systems. Prerequisites: 12 semester hours of biology and 6 semester hours of chemistry.

Fee: \$20.00

BIOL 4102 Seminar (WI) 1 SCH (1-0)

Current biological literature with critical class reports. Course may be repeated for credit. Prerequisite: 12 semester hours of biology.

BIOL 4304 Research Projects in Biol 1-3 SCH (1-3)

An independent review of literature and a laboratory or field problem yielding a formal report on the research. Variable credit dependent upon the project. May be repeated not to exceed accumulated total of 3 semester hours applicable to requirements for the major in biology. Prerequisite: advanced standing and prior approval of the problem by the supervising instructor.

BIOL 4332 Pathophysiology 3 SCH (3-0)

Fundamental concepts of pathophysiology, including changes at the cellular, organ, system, and whole-organism levels during the disease state.

Prerequisites: BIOL 1306/BIOL 1106, BIOL 1307/BIOL 1107, BIOL 2421, and BIOL 3402. BIOL 2401 and 2402, or BIOL 3408 is recommended.

BIOL 4334 Molecular Neurobiology 3 SCH (3-0)

Fundamental concepts of neurobiology, including neuronal electrical signaling, synaptic transmission, signal transduction, neurotransmitter diversity, neural development, and synaptic. Prerequisites: BIOL 1306/BIOL 1106, BIOL 1307/BIOL 1107, BIOL 2421, and BIOL 3402. Either BIOL 2401 and BIOL 2402, or BIOL 3408 is recommended.

BIOL 4335 Molecular Genetics 3 SCH (3-0)

Fundamental concepts of molecular genetics, including gene structure and diversity, chromatin organization, nucleosomes, gene expression, and epigenetics. BIOL 1306/BIOL 1106, BIOL 1307/BIOL 1107, BIOL 2421, and BIOL 3402.

BIOL 4336 Ecology and Human Disease 3 SCH (3-0)

This three-credit interdisciplinary course examines the ecological and socio-economic foundations of human disease. Topics include genetic-environment interactions, public health policy, disease control, and host-pathogen dynamics. Through case studies and ecological analysis, students explore how biological, cultural, political, and environmental factors shape disease patterns and impact human communities. Prerequisite: 12 semester hours of biology, including BIOL 1307 and BIOL 1107 or permission from the instructor. BIOL 3407 is strongly recommended.

BIOL 4355 Topics in Biology 3 SCH (3)

Lectures in selected topics. May be repeated for credit under a different topic. Prerequisite: 12 semester hours of biology or equivalent.

BIOL 4401 Molecular Biology 4 SCH (3-3)

The application of modern molecular techniques to manipulate the replication and expression of genes. The laboratory will introduce basic and advanced molecular techniques. Prerequisites: 12 semester hours of biology and BIOL 3402.

Fee: \$20.00

BIOL 4406 Bacteriology 4 SCH (3-3)

Survey of medical, public health, water, sewage and milk bacteriology. Bacteriological technique is emphasized. Prerequisites: 12 semester hours of biology, including BIOL 2421; 6 semester hours of chemistry recommended.

Fee: \$6.00

BIOL 4408 Immunology 4 SCH (3-3)

Experimental studies in the principles of infection and immunity. Prerequisite: 12 semester hours of biology, including BIOL 4406; organic chemistry recommended.

Fee: \$6.00

BIOL 4410 Topics in Biology 4 SCH (3-3)

Lectures, literature investigation and research in selected topics. May be repeated for credit under a different topic. Prerequisite: 12 semester hours of biology or equivalent.

Fee: \$20.00

BIOL 4425 Ornithology 4 SCH (3-3)

Classification, structures, physiology, natural history and field identification of birds. Prerequisite: 12 semester hours of biology.

Fee: \$20.00

BIOL 4426 Cellular Physiology 4 SCH (3-3)

Physiochemical function at the cellular level. Prerequisites: 12 semester hours of Biology and CHEM 3312/CHEM 3123, CHEM 3325/3125; PHYS 1301/1101 and PHYS 1302/1102 recommended.

Fee: \$20.00

BIOL 4427 Herpetology 4 SCH (3-3)

Classification, anatomy, life history and distribution of reptiles and amphibians with special emphasis on local forms. Prerequisite: 12 semester hours of biology.

Fee: \$20.00

BIOL 4429 Mammalogy 4 SCH (3-3)

Classification, distribution, life histories, economic importance, techniques of field study, methods of collection and preservation of mammals.

Prerequisite: 12 semester hours of biology.

Fee: \$20.00

BIOL 4431 Ichthyology 4 SCH (3-3)

Classification, anatomy, life history and distribution of fishes, with special emphasis on local fresh water forms. Prerequisite: 12 semester hours of biology.

Fee: \$20.00

BIOL 4433 Histology 4 SCH (0-3-0-3)

Fundamental concepts of histology, including microanatomy of tissues, organ systems, and organ physiology. Prerequisites: BIOL 1306/BIOL 1106, BIOL 1307/BIOL 1107, BIOL 2421, and BIOL 3402.

Fee: \$20.00

BIOL 4434 Biology of Forensic Science I 4 SCH (3-3)

Study of crime scene protocol, evidence collection, and analysis of trace evidence such as finger prints, hairs and fibers, DNA and blood. Prerequisite: 12 semester hours of biology or permission from the instructor.

Fee: \$20.00

BIOL 4435 Biology of Forensic Science II 4 SCH (3-3)

Concepts of forensic science such as determining time and place of death as well as methods of rigor mortis, algor mortis, and livor mortis. Identification of bodies by analysis of trace evidence such as pollen and diatoms as well as anthropology and odontology. Prerequisites: 12 semester hours of biology or permission from the instructor.

BIOL 4436 Human Ecology and Health 4 SCH (3-3)

This four-credit interdisciplinary course examines the relationship between humans and the environment, emphasizing health, ecology, and sustainability. Through lectures, labs, and local fieldwork, students explore topics like climate change, energy policy, and urban planning, while learning basic ecological principles, data analysis methods, and the societal impacts on human health. Prerequisite: Prerequisite: 12 semester hours of biology, including BIOL 1307 and BIOL 1107, or permission from the instructor. BIOL 3407 is strongly recommended.