

ADVANCED STUDIES IN BIOLOGY FOR HEALTH PROFESSIONS

SPS Certificate website: <https://sps.northwestern.edu/premedicine-prohealth/advanced-biology-health-professions/>

Advanced Studies in Biology for Health Professions draws students from a wide range of backgrounds who are interested in careers in medicine, physical therapy, physician assistant studies or other health careers. Students complete four to eight advanced undergraduate courses in biology to help them prepare for professional programs.

Certificate Offered

- Advanced Studies in Biology for Health Professions, Certificate (<https://catalogs.northwestern.edu/sps/certificates/post-baccalaureate/advanced-studies-biology-health-professions/advanced-studies-biology-health-professions-certificate/>)

Advanced Studies in Biology for Health Professions Courses

BIOL_SCI 115-CN The Human Brain (1 Unit)

Overview of the development, structure and function of the human nervous system; terminology and principles of neuroanatomy, neurochemistry, physiology, and molecular biology. How the brain works and its role in human behavior and psychopathology. Issues raised by new medical technologies.

BIOL_SCI 167-CN Genetics and Evolution (1 Unit)

NPEP course.

BIOL_SCI 170-CN Concepts of Biology (1 Unit)

General biological sciences introduction. Topics include evolution, biomolecules, cell biology, genetics, population biology, and the relationship between structure and function in organisms. The course is geared toward students with an interest in the topic but without a background in biological sciences.

BIOL_SCI 170-DL Concepts of Biology (1 Unit)

General biological sciences introduction. Topics include evolution, biomolecules, cell biology, genetics, population biology, and the relationship between structure and function in organisms. The course is geared toward students with an interest in the topic but without a background in biological sciences.

BIOL_SCI 202-CN The Evolutionary Biology of Human Anatomy, Health and Disease (1 Unit)

How an evolutionary perspective informs our understanding of human anatomy, health and disease.

BIOL_SCI 215-CN Genetics and Molecular Biology (1 Unit)

Principles of inheritance; gene function; mechanisms by which DNA is replicated, transcribed into RNAs, and translated into proteins; basics of the process of natural selection.

Prerequisite: one year of general chemistry with laboratory.

BIOL_SCI 217-CN Physiology (1 Unit)

Organization and functioning of the major organ systems in mammals.

Prerequisite: CHEM 131-CN.

BIOL_SCI 219-CN Cell Biology (1 Unit)

Mechanisms that cells use to compartmentalize and transport proteins, to move, to regulate growth and death, and to communicate with their environments.

Prerequisite: CHEM 132-CN.

BIOL_SCI 220-CN Genetic and Molecular Processes Laboratory (0.34 Unit)

Laboratory techniques and experiments in fundamental aspects of transmission genetics and molecular biology. Credit for this course is 0.34 units.

Prerequisite: CHEM 132-CN.

BIOL_SCI 221-CN Cellular Processes Laboratory (0.34 Unit)

Laboratory techniques and experiments in fundamental aspects of cell biology. Credit for this course is 0.34 units.

Prerequisite: grades of C- or higher in both BIOL_SCI 220-CN and CHEM 132-CN.

BIOL_SCI 222-CN Investigative Lab (0.34 Unit)

A culminating life-science lab experience. Credit for this course is 0.34 units.

Prerequisite: CHEM 132-CN and BIOL_SCI 221-CN.

BIOL_SCI 302-CN Fundamentals of Neurobiology (1 Unit)

Structure and function of the mammalian central nervous system from the molecular to behavioral level. Emphasis on foundational concepts in neurobiology, including neuronal and glial structure and function, neurophysiology of membrane, resting and action potential, synaptic physiology, an introduction to sensory perception, neuronal plasticity in learning and memory.

Prerequisite: BIOL_SCI 215-CN and BIOL_SCI 219-CN. Recommended: BIOL_SCI 308-CN.

BIOL_SCI 302-DL Fundamentals of Neurobiology (1 Unit)

Structure and function of the mammalian central nervous system from the molecular to behavioral level. Emphasis on foundational concepts in neurobiology, including neuronal and glial structure and function, neurophysiology of membrane, resting and action potential, synaptic physiology, an introduction to sensory perception, neuronal plasticity in learning and memory.

Prerequisite: BIOL_SCI 215-CN and BIOL_SCI 219-CN. Recommended: BIOL_SCI 308-CN.

BIOL_SCI 308-CN Biochemistry (1 Unit)

Basic concepts in biochemistry, emphasizing the structure and function of biological macromolecules, fundamental cellular biochemical processes, and the chemical logic in metabolic transformations.

Prerequisite: BIOL_SCI 217-CN and CHEM 210-A.

BIOL_SCI 312-CN The Evolutionary Biology of Human Anatomy, Health and Disease (1 Unit)

Key features of human anatomy, health and disease from an evolutionary perspective. Review of some evolutionary processes, overview of human evolutionary history, consideration of the primary body systems and regions in the human organism. The historical context of selected human structures and their function/dysfunction across these systems.

BIOL_SCI 313-CN Human Anatomy (1 Unit)

An introduction to human anatomy. Topics include system approach to anatomical organization; sections of the body; musculoskeletal and nervous systems; embryology development. Lectures are supplemented by selected dissections of human cadavers and dry exercises using bones, models, and computer animations.

Prerequisite: BIOL_SCI 170-CN, or equivalent course.

BIOL_SCI 313-DL Human Anatomy (1 Unit)

An introduction to human anatomy. Topics include system approach to anatomical organization; sections of the body; musculoskeletal and nervous systems; embryology development. Lectures are supplemented by selected dissections of human cadavers and dry exercises using bones, models, and computer animations.

Prerequisite: BIOL_SCI 170-CN, or equivalent course.

BIOL_SCI 315-CN Advanced Cell Biology (1 Unit)

Relationship of shape, structural dynamics, and function with the cellular state and gene expression; cell-to-cell communication.

Prerequisite: BIOL_SCI 219-CN.

BIOL_SCI 316-CN Human Structure and Function (1 Unit)

The function of the musculoskeletal system in modern humans. A comparative perspective emphasizing the adaptive contexts of the evolutionary transformations leading to our modern anatomy. Structural, functional, and evolutionary anatomy of humans, with primary focus on the musculoskeletal system of the postcranium. General biomechanical principles of anatomical systems are covered through the regional anatomy of the muscles, bones and joints. Lectures are supplemented by selected dissections of human cadavers, in-class lab sessions examining bones and models, and computer animations and exercises.

Prerequisite: BIOL_SCI 313-CN, equivalent anatomy course, or permission of instructor.

BIOL_SCI 317-CN Regional Human Anatomy Lab (0.34 Unit)

Lab course utilizing dissections and demonstrations of human cadavers. It is an advanced anatomy course examining the details of human body systems. Topics include: body wall and cavities, contents and features of the thorax and abdomen (cardiac, pulmonary, and gastrointestinal systems), pelvis (genito-urinary system), spinal cord and back, innervation and blood supply of the upper and lower limbs, cranial cavities and contents, cranial nerves and blood supply of the head and neck. Credit for this course is 0.34 units.

Prerequisite: BIOL_SCI 313-CN or equivalent.

BIOL_SCI 318-CN Advanced Human Physiology (1 Unit)

Builds on concepts covered in BIOL_SCI 217-CN or an equivalent physiology course focusing on the body as an integrated set of systems. A global view of the body, its systems, and the many processes that keep the systems working. Integrated approach to studying all major organ systems including neural, autonomic/somatic motor, endocrine, cardiovascular, respiratory, renal, digestive, and reproductive physiology. The clinical relevance of the organ system that will include abnormal function, disease states, and medications used to bring the system back to normal functioning.

Prerequisite: BIOL_SCI 217-CN or equivalent.

BIOL_SCI 318-DL Advanced Human Physiology (1 Unit)

Builds on concepts covered in BIOL_SCI 217-CN or an equivalent physiology course focusing on the body as an integrated set of systems. A global view of the body, its systems, and the many processes that keep the systems working. Integrated approach to studying all major organ systems including neural, autonomic/somatic motor, endocrine, cardiovascular, respiratory, renal, digestive, and reproductive physiology. The clinical relevance of the organ system that will include abnormal function, disease states, and medications used to bring the system back to normal functioning.

Prerequisite: BIOL_SCI 217-CN or equivalent.

BIOL_SCI 325-CN Animal Physiology (1 Unit)

Physiological principles and mechanisms responsible for the ability of animals to regulate variables in the steady state.

Prerequisite: BIOL_SCI 217-CN.

BIOL_SCI 327-CN Biology of Aging (1 Unit)

Biological aspects of aging, from molecular to evolutionary.

Prerequisite: BIOL_SCI 219-CN and BIOL_SCI 217-CN.

BIOL_SCI 328-A Microbiology Lab (0 Unit)

Laboratory section for BIOL_SCI 328-CN.

BIOL_SCI 328-CN Microbiology (1 Unit)

How microbes interact with their environments, including with humans.

Prerequisite: BIOL_SCI 217-CN.

BIOL_SCI 342-CN Evolutionary Processes (1 Unit)

Evolutionary mechanisms (natural selection, genetic drift), evolutionary history (speciation, phylogenetics), and adaptations (sex, cooperation, aging, life history).

Prerequisite: BIOL_SCI 215-CN and BIOL_SCI 219-CN.

BIOL_SCI 355-CN Immunobiology (1 Unit)

Nature of host resistance; characteristics of antigens, antibodies; basis of immune response; hypersensitivity.

Prerequisite: BIOL_SCI 217-CN.

BIOL_SCI 355-DL Immunobiology (1 Unit)

Nature of host resistance; characteristics of antigens, antibodies; basis of immune response; hypersensitivity.

Prerequisite: BIOL_SCI 217-CN.