

PREPHYSICIAN ASSISTANT

SPS Certificate website: <https://sps.northwestern.edu/premedicine-prohealth/prephysician-assistant/>

The prephysician assistant certificate admits post-baccalaureate students into a program of study that will aid them in meeting the entrance requirements for master's programs for physician assistants (PAs). While this program meets most minimal requirements for applications to physician assistant graduate programs in the Chicago area, students are strongly advised to confirm the admission requirements of the graduate programs in which they are interested before enrolling to ensure that the SPS program fulfills their needs. This program is designed for career changers who do not have an extensive background in science and can be completed in 15 or 21 months. Students who need only some of these courses should consider the Advanced Studies in Biology for Health Professions (<https://catalogs.northwestern.edu/sps/certificates/post-baccalaureate/advanced-studies-biology-health-professions/>) certificate program, or designing a specialized post-baccalaureate certificate (<https://catalogs.northwestern.edu/sps/certificates/post-baccalaureate/specialized-studies/>) to meet their needs.

Certificate Offered

- Prephysician Assistant, Certificate (<https://catalogs.northwestern.edu/sps/certificates/post-baccalaureate/prephysician-assistant/prephysician-assistant-certificate/>)

Prephysician Assistant Courses

BIOL_SCI 201-CN Molecular Biology (1 Unit)

Basics of molecular biology, including the structure of macromolecules, DNA replication, transcription, and translation and the mechanisms by which these processes are regulated. Current biotechnology methods used to study molecular biology. Credit not allowed for both BIOL_SCI 201-CN and BIOL_SCI 215-CN.

BIOL_SCI 202-CN Cell Biology (1 Unit)

How an evolutionary perspective informs our understanding of human anatomy, health and disease. Mechanisms the cell uses to compartmentalize and transport proteins, to move, to regulate growth and death, and to communicate with their environments.

Prerequisite: Students must have completed, with a C- or better, BIOL_SCI 201-CN or 215-CN to register for this course. Should be taken concurrently with BIOL_SCI 232-CN. Credit not allowed for both BIOL_SCI 219-CN and BIOL_SCI 202-CN.

BIOL_SCI 203-CN Genetics and Evolution (1 Unit)

Fundamentals of genetics and evolution. From the rules of heredity to the complex genetics of humans, the methods and logic of genetics as applied to inheritance, development, neurobiology, and populations. The process and tempo of evolution, from natural selection to speciation, emphasizing how genetics plays a critical role.

Prerequisite: Students must have completed, with a C- or better, BIOL_SCI 202-CN or BIOL_SCI 219-CN to register for this course.

BIOL_SCI 232-CN Molecular and Cellular Processes Laboratory (0.34 Unit)

Laboratory techniques and experience that investigates relevant scientific research and teaches scientific inquiry skills such as experimental design, writing research proposals, data collection, data analysis/interpretation, and the presentation of results. The experimental model revolves around atherosclerosis and macrophage phagocytosis

of apoptotic cells. Various cell and molecular biology techniques. Should be taken concurrently with BIOL_SCI 202-CN. Credit not allowed for both BIOL_SCI 221-CN and BIOL_SCI 232-CN.

BIOL_SCI 233-CN Genetics and Molecular Processes Laboratory (0.34 Unit)

Laboratory techniques and experience that investigates relevant scientific research and teaches scientific inquiry skills such as experimental design, writing research proposals, data collection, data analysis/interpretation, and the presentation of results. The experimental model revolves around aggregate prone proteins in nematodes and RNA interference (RNAi) affecting protein folding and the clearance of protein aggregates. Various cell and molecular biology techniques.

Prerequisite: Students must have completed BIOL_SCI 232-CN. Credit not allowed for both BIOL_SCI 220-CN and BIOL_SCI 233-CN.

BIOL_SCI 234-CN Investigative Laboratory (0.34 Unit)

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 310-CN Human Physiology (1 Unit)

An exploration of the functions of the human body at the tissue, organ, and organ system level. Emphasis on homeostatic mechanisms and interdependence within organs and organ systems and the influence of modulatory systems. Topics will include, but are not limited to: nervous, cardiovascular, respiratory, and renal systems.

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 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 328-CN Microbiology (1 Unit)

How microbes interact with their environments, including with humans.

Prerequisite: BIOL_SCI 217-CN.

CHEM 110-CN Quantitative Problem Solving in Chemistry (1 Unit)

Solution strategies for traditional word problems and their application to basic chemistry quantitative problems: dimensional analysis, chemical equations, stoichiometry, limiting reagents.

CHEM 131-CN Fundamentals of Chemistry I (1 Unit)

Quantum mechanics, electronic structure, periodic properties of the elements, chemical bonding, thermodynamics, intermolecular forces, properties of solids and liquids, special topics in modern chemistry. Must be taken concurrently with CHEM 141-CN.

Prerequisite: grade of C- or higher in CHEM 110-CN.

CHEM 132-CN Fundamentals of Chemistry II (1 Unit)

Solutions and colligative properties, chemical equilibrium, aqueous solution equilibria, chemical kinetics, metals in chemistry and biology, oxidation-reduction reactions and electrochemistry, special topics in modern chemistry. Must be taken concurrently with CHEM 142-CN.

Prerequisite: grade of C- or higher in CHEM 131-CN and CHEM 141-CN.

CHEM 141-CN Fundamentals of Chemistry Laboratory I (0.34 Unit)

Chemical analysis of real samples using basic laboratory techniques including titration, colorimetric analysis, density measurements, and atomic spectroscopy. Planning, data collection, interpretation, and reporting on experiments. Credit for this course is 0.34 units. Must be taken concurrently with CHEM 131-CN.

Prerequisite: grade of C- or higher in CHEM 110-CN.

CHEM 142-CN Fundamentals of Chemistry Laboratory II (0.34 Unit)

Chemistry laboratory techniques applied to materials science and nanotechnology, acid-base chemistry, and chemical kinetics. Planning, data collection, interpretation, and reporting on experiments. The course must be taken concurrently with CHEM 132-CN. Credit for this course is 0.34 units.

Prerequisite: grade of C- or higher in CHEM 131-CN.

CHEM 215-A Organic Chemistry I (1 Unit)

Foundational concepts in organic chemistry will be introduced. Topics include structure and properties of common functional groups, acidity/basicity, conformational analysis, stereochemistry, and reactivity of organic compounds. The chemistry of hydrocarbons, alkyl halides, and alcohols, ethers, and carbonyl compounds included.

Prerequisite: CHEM 132-CN and CHEM 142-CN (C- or better in all listed courses) or permission of department by placement exam. Must be taken concurrently with CHEM 235-A.

CHEM 235-A Organic Chemistry Lab I (0.34 Unit)

Standard laboratory techniques in organic chemistry will be covered. Techniques will focus on the isolation and purification of organic compounds as well as the use of spectroscopic methods to determine identity and purity.

Prerequisite: CHEM 132-CN and CHEM 142-CN (C- or better in all listed courses) or permission of department by placement exam. Must be taken concurrently with CHEM 215-A.

CLASSICS 110-CN Scientific Vocabulary through Classical Roots (1 Unit)

Greek and Latin etymology in the vocabulary of the sciences. Designed primarily for science or medical students. Self-paced independent study.

STAT 202-DL Introduction to Statistics and Data Science (1 Unit)

This course provides an introduction to the basic concepts of statistics. Throughout the course, students will learn to: summarize data using graphs and tables; explain/calculate descriptive statistics, confidence intervals, correlation, regression, and probability; and explain tests of significance and data-production including sampling and experiments. Basic knowledge of algebra is recommended.

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 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.

KINS 237-CN Foundations of Human Movement (1 Unit)

An introductory course examining the biomechanical and physiological factors contributing to the control of human movement. This course concentrates on the biomechanical principles of the musculoskeletal system and how these principles impact global human movements as well as joint-specific movement. It will also encompass the foundational physiology of muscle tissue and how it facilitates movement about a joint. Learning experiences will include self-paced online modules, in-person lectures, laboratories, and task analysis activities to foster the ability to comprehend the foundational principles that drive human movement.

PRO_HLTH 390-DL Interprofessional Health Practice (1 Unit)

Interprofessional education is important for preparing health professions students to provide patient care in a collaborative team environment, as an interprofessional approach leads to improved patient outcomes. Interprofessional Health Practice promotes the development of skills and attitudes needed to work effectively in a healthcare community. Through case studies, role play, interactive activities, reflection, and research, students will increase their knowledge in the four core competencies of interprofessional work as outlined by the Interprofessional Education Collaborative (IPEC).