

# PHPH - PHYSLGY & PHARMACOLOGY (PHPH)

## **PHPH 701 - Physiology for Health Sciences (6 Credits)**

Major organ systems with emphasis on basic physiological processes and control systems. Primarily for health sciences graduate students.

## **PHPH 703 - Human Neuroanatomy (4 Credits)**

Lecture, laboratory, and independent study devoted to the structure and function of the human nervous system. Emphasis on those features of the nervous system of contemporary research interest.

## **PHPH 705 - Biomedical Pharmacology (6 Credits)**

Lectures and conference discussions covering principles of drug action; autonomic (adrenergic/cholinergic), cardiovascular, renal, central nervous system, endocrine and antimicrobial pharmacology, cancer chemotherapy, and toxicology.

**Prerequisites:** PHPH 701 or PHPH 720.

## **PHPH 720 - Graduate Physiology Lecture and Laboratory (8 Credits)**

Lecture, discussions, and laboratory covering: cell, muscle, respiratory, circulatory, gastrointestinal, metabolism, endocrinology, nervous system, and reproduction. Students will conduct physiology experiments to gain knowledge of experimental techniques and data collection.

## **PHPH 725 - Autonomic Pharmacology (3 Credits)**

Functional regulation of biosynthesis, release and reuptake of neurotransmitters as well as the role of transmitters in regulating physiological processes will be presented. Emphasis will be placed on experimental techniques used in this area of pharmacology.

**Prerequisites:** graduate physiology, pharmacology, and biochemistry.

## **PHPH 730 - Seminar in Neuroanatomy (1-3 Credits)**

Advanced study of selected topics in neuroanatomy.

## **PHPH 735 - Cardiovascular Pharmacology (3 Credits)**

An in-depth examination of the cardiovascular system with an emphasis on hemodynamic principles, cardiac regulation, and the use of drugs in various pathological states of the mammalian heart.

## **PHPH 739 - Drug Action on Ion Movements (3 Credits)**

The actions of several classes of drugs that alter ion movements in excitable tissues will be explored in depth with emphasis on models of drug actions and altered responses in hereditary and disease states.

**Prerequisites:** PHPH 705.

## **PHPH 740 - Neuroscience (4 Credits)**

Cellular and molecular principles of neurobiology and neuroscience topics from a research-oriented perspective.

**Prerequisites:** BMSC 754 or CHEM 754.

## **PHPH 741 - Special Topics in Neuroscience (1-3 Credits)**

Tutorial instruction and group discussion of select topics in neuroscience involving neuroendocrinology, neuropharmacology, developmental neurobiology, or neuropsychobiology. Content varies by title and may be repeated up to a maximum of 6 credits total.

## **PHPH 742 - Neuroscience Seminar (1 Credit)**

Presentation and group discussion of research articles in neuroscience. Focus on improvement of critical thinking and scientific writing skills, as well as development of research ideas.

## **PHPH 743 - Scientific Communication (1 Credit)**

This course is focused on the principles of effective scientific communication. The major focus of instruction is on developing and giving high-quality scientific presentations to scientists and non-scientists.

## **PHPH 744 - Grant Writing (1 Credit)**

This course is focused on developing the skills required to navigate the grant writing process, with an emphasis on developing a competitive pre-doctoral grant application for PhD candidates in Neuroscience or related fields.

## **PHPH 745 - Neurophysiology (3 Credits)**

Generation and transmission of excitation in the mammalian nervous system. Integrated function of the nervous system with emphasis on interactions of autonomic, neuroendocrine, and behavioral mechanisms contributing to homeostatic regulation.

## **PHPH 746 - Manuscript Writing (1 Credit)**

This course covers the fundamentals of scientific manuscript writing with a focus on neuroscience topics. Students will develop skills for writing effective publication-quality manuscripts and will focus on improving clarity, concision, and accuracy of scientific reporting. Lectures will cover ethical issues and navigating the submission, revision, and resubmission process.

## **PHPH 747 - Career Development (1 Credit)**

This course is focused on career and professional development for PhD candidates in neuroscience or related fields.

## **PHPH 750 - Fundamental Neuroscience I (4 Credits)**

Integrated foundation in neuroanatomical and neurophysiological principles from a research-oriented perspective.

## **PHPH 751 - Fundamental Neuroscience II (4 Credits)**

Integrated foundation in neurochemical and neuropharmacological principles from a research-oriented perspective. Includes aspects of molecular neuroscience and systems analyses.

## **PHPH 752A - Neurobiology Basics Module: Neuroanatomy (2 Credits)**

Principles of neuroanatomy necessary for research in neurobiology-related disciplines. Each 5-week module provides fundamentals of particular aspects of neurobiology, including neuroanatomy, neurophysiology, neurochemistry, molecular neurobiology, and neuropharmacology, or skills necessary for research in neurobiology-related disciplines.

## **PHPH 752B - Neurobiology Basics Module: Neurochemistry–Fundamental Concepts (2 Credits)**

Principles required for understanding chemical and cellular processes in the nervous system. Each 5-week module provides fundamentals of particular aspects of neurobiology, including neuroanatomy, neurophysiology, neurochemistry, molecular neurobiology, and neuropharmacology, or skills necessary for research in neurobiology-related disciplines.

## **PHPH 752C - Neurobiology Basics Module: Neurochemistry–Advanced Concepts (2 Credits)**

In-depth analysis of neurochemical processes, signaling, and pathways in the nervous system. Each 5-week module provides fundamentals of particular aspects of neurobiology, including neuroanatomy, neurophysiology, neurochemistry, molecular neurobiology, and neuropharmacology, or skills necessary for research in neurobiology-related disciplines.

**PHPH 752D - Neurobiology Basics Module: Neurophysiology (2 Credits)**

Principles required for understanding neurophysiological processes and integrated nervous system functions. Each 5-week module provides fundamentals of particular aspects of neurobiology, including neuroanatomy, neurophysiology, neurochemistry, molecular neurobiology, and neuropharmacology, or skills necessary for research in neurobiology-related disciplines.

**PHPH 752E - Neurobiology Basics Module: Physiology for Neurobiologists (2 Credits)**

Principles of physiological processes and the nervous system control of such processes. Each 5-week module provides fundamentals of particular aspects of neurobiology, including neuroanatomy, neurophysiology, neurochemistry, molecular neurobiology, and neuropharmacology, or skills necessary for research in neurobiology-related discipline.

**PHPH 752F - Neurobiology Basics Module: Neuropharmacology (2 Credits)**

Principles of neuropharmacology and how drugs act on the nervous system. Each 5-week module provides fundamentals of particular aspects of neurobiology, including neuroanatomy, neurophysiology, neurochemistry, molecular neurobiology, and neuropharmacology, or skills necessary for research in neurobiology-related disciplines.

**PHPH 752G - Neurobiology Basics Module: Molecular Neurobiology (2 Credits)**

Principles related to cellular and molecular control of neurobiological processes. Each 5-week module provides fundamentals of particular aspects of neurobiology, including neuroanatomy, neurophysiology, neurochemistry, molecular neurobiology, and neuropharmacology, or skills necessary for research in neurobiology-related disciplines.

**PHPH 752H - Neurobiology Basics Module: Quantitative Methods in Neurobiology (2 Credits)**

Principles for quantifying changes related to neurobiological research. Each 5-week module provides fundamentals of particular aspects of neurobiology, including neuroanatomy, neurophysiology, neurochemistry, molecular neurobiology, and neuropharmacology, or skills necessary for research in neurobiology-related disciplines.

**PHPH 752I - Neurobiology Basics Seminar (2 Credits)**

Novel topics in neurobiology offered as the field progresses. Each 5-week module provides fundamentals of particular aspects of neurobiology, including neuroanatomy, neurophysiology, neurochemistry, molecular neurobiology, and neuropharmacology, or skills necessary for research in neurobiology-related disciplines.

**PHPH 753A - Neurobiology of Disease Module: Stress, Anxiety Disorders, and the Amygdala (2 Credits)**

Team taught modules integrate the clinical, basic, technical, and social issues surrounding the neurobiological basis of anxiety. Research-oriented and literature-based approaches integrate the molecular, cellular, systems, and translational levels of stress, the amygdala, and anxiety disorders. Team taught, 5-week modules integrate the clinical, basic, technical, and ethical issues surrounding a specific neurobiological disease. Modules focus on research oriented and literature-based approaches to the molecular, cellular, systems, and translation.

**PHPH 753B - Neurobiology of Disease Module: Stress, Depression, and Hippocampus (2 Credits)**

Team-taught modules integrate the clinical, basic, technical, and social issues surrounding the neurobiological basis of depression. Research-oriented approach integrates the molecular, cellular, systems, and translational levels of stress, the hippocampus, and depression. Team taught, 5-week modules integrate the clinical, basic, technical, and ethical issues surrounding a specific neurobiological disease. Modules focus on research oriented and literature-based approaches to the molecular, cellular, systems, and translation.

**PHPH 753C - Neurobiology of Disease Module: Degenerative Diseases of Old Age (2 Credits)**

Team-taught modules integrate the clinical, basic, technical, and social issues surrounding the neurodegenerative diseases associated with aging. Research-oriented approaches integrate the molecular, cellular, systems, and translational levels of disorders such as Parkinsons, Alzheimers, and stroke. Team taught, 5-week modules integrate the clinical, basic, technical, and ethical issues surrounding a specific neurobiological disease. Modules focus on research oriented and literature-based approaches to the molecular, cellular, systems, and translation.

**PHPH 753D - Neurobiology of Disease Module: Chronic Pain and Analgesia (2 Credits)**

Team-taught modules integrate the clinical, basic, technical, and social issues surrounding the neurobiological basis of pain. Research-oriented and literature-based approaches integrate the molecular, cellular, systems, and translational basis of chronic pain and its treatment. Team taught, 5-week modules integrate the clinical, basic, technical, and ethical issues surrounding a specific neurobiological disease. Modules focus on research oriented and literature-based approaches to the molecular, cellular, systems, and translation.

**PHPH 753E - Neurobiology of Disease Module: Schizophrenia, Prefrontal Cortex, and Executive Function (2 Credits)**

Team-taught modules integrate the clinical, basic, technical, and social issues surrounding the neurobiological basis of disorders of cognition such as schizophrenia. Research-oriented approaches integrate the molecular, cellular, systems, and translational aspects of prefrontal cortex control of executive function and its role in schizophrenia. Team taught, 5-week modules integrate the clinical, basic, technical, and ethical issues surrounding a specific neurobiological disease. Modules focus on research oriented and literature-based approaches to the molecular, cellular, systems, and translation.

**PHPH 753F - Neurobiology of Disease Module: Epilepsy (2 Credits)**

Team-taught modules integrate the clinical, basic, technical, and social issues surrounding the neurobiological basis of epilepsy. Research-oriented and literature-based approaches integrate the molecular, cellular, systems, and translational levels of seizure disorders and their treatment. Team taught, 5-week modules integrate the clinical, basic, technical, and ethical issues surrounding a specific neurobiological disease. Modules focus on research oriented and literature-based approaches to the molecular, cellular, systems, and translation.

**PHPH 760 - Clinical Problems in Anesthesia (1-3 Credits)**

Tutorial instruction in anesthesia. This course may be repeated up to a maximum of 6 credits total.

**PHPH 761 - Principles and Practice of Anesthesia 1 (7 Credits)**

Foundational and basic concepts of anesthesia practice integrated into supervised clinical training to reinforce principles of anesthesia care.

**PHPH 762 - Principles and Practice of Anesthesia 2 (6 Credits)**

Foundational and advanced concepts of anesthesia practice integrated into supervised clinical training to reinforce principles of anesthesia care.

**Prerequisites:** PHPH 761.

**PHPH 765 - Tutorials in Pharmacology and Physiology (1-3 Credits)**

Tutorial instruction in pharmacology and physiology. This course may be repeated up to a maximum of 6 credits total.

**PHPH 770 - Seminar in Pharmacology and Physiology (1-2 Credits)**

Group discussions by students and staff based on literature surveys and current research in pharmacology and physiology.

**PHPH 772 - Seminar in Anesthesia (1-2 Credits)**

Group discussions by students and staff based on literature surveys and current research in anesthesia.

**PHPH 773 - Health Assessment in Anesthesia (1 Credit)**

Preoperative assessment, intraoperative management and postoperative management of patients receiving anesthesia. Development of cognitive and psychomotor skills needed to perform an advanced health assessment for patients undergoing anesthesia.

**PHPH 775 - Practicum I in Nurse Anesthesia (6 Credits)**

Introduction to the cognitive and clinical skills necessary to perform effective anesthesia in a supervised clinical setting.

**PHPH 777 - Pract II Nurse Anesthesia (6 Credits)**

Supervised clinical practicum in nurse anesthesia for students beginning their second year of training.

**Prerequisites:** PHPH 775.

**PHPH 779 - Practicum III Nurse Anesthesia (6 Credits)**

Advanced, supervised clinical practicum in nurse anesthesia for students in their second year of training.

**Prerequisites:** PHPH 777.

**PHPH 780 - Research in Pharmacology and Physiology (1-6 Credits)**

Graduate research designed by student in conjunction with research advisory committee.

**PHPH 781 - Practicum IV Nurse Anesthesia (6 Credits)**

To instruct nurse anesthesia students entering their third year of training to the advanced cognitive and clinical skills necessary to perform effective anesthesia in a supervised clinical setting.

**Prerequisites:** PHPH 779.

**PHPH 791 - Principles of Anesthesia I (1-5 Credits)**

Pre and post-operative evaluation, principles, and techniques of anesthesia, and the use of the anesthesia machine, ventilators, and monitoring equipment used in the administration of anesthesia. Course can be taken up to 5 total credits.

**PHPH 792 - Principles of Anesthesia II (1-5 Credits)**

Continuation of PCOL 791. Anesthetic techniques for specialty surgery including neurological, cardiovascular-thoracic, pediatric, and obstetrical surgery. May be repeated for a total of up to 5 credits.

**PHPH 795 - Physical-Chemical Basis of Anesthetic Action (3 Credits)**

Physical and chemical concepts and their relationships to the principles of anesthesia. Includes the behavior of gases and the gas laws, chemical composition of anesthetic agents and drugs.

**PHPH 797 - Professional Aspects of Nurse Anesthesia (3 Credits)**

An overview of the professional, practical, and educational issues of the practice of nurse anesthesia. Includes the history of anesthesia practice, psychological, and ethical issues, legal aspects of anesthesia practice, and current trends in anesthesia practice.

**PHPH 798 - Biomedical Sciences for Nurse Anesthesia (3 Credits)**

Human anatomy, biochemistry, and pathological processes necessary for the practice of the health-related professions.

**PHPH 899 - Dissertation Preparation (1-12 Credits)**