

# PHR-Pharmacology

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## Courses

### PHR 200. Introduction to Drugs. 3 Hours.

This course is designed for science and nonscience majors to provide an introduction to the field of pharmacology, the science of how drugs act on biological systems and how the body processes drugs. The course begins with a conversation on highlights in the history of medicinal drug use, and then transitions to how drugs interact with cells to achieve therapeutic and toxic effects, and the influence of genetics on drug response. It includes highlights of the drug discovery and approval process, review of controlled substances and drugs of abuse, and will conclude with a discussion of careers in pharmacology. Students will work in teams to prepare presentations on a drug topic of interest that will be delivered to their course colleagues.

### PHR 400. CANCER PHARMACOLOGY. 3 Hours.

This course will introduce different types or classes of chemotherapeutic agents currently used in the clinic for the treatment of cancer. These include classic chemotherapeutic agents and newer targeted agents. Students will learn the latest cancer chemotherapy and treatment strategy. Students will also learn historical aspects of cancer treatment and of drug development for this disease. Team projects will prepare students to participate in literature reviews, presentation preparation and skills, and approaches to preparing for scientific discussions and Q&A sessions.

### PHR 411. Foundations of Pharmacology & Toxicology. 3 Hours.

This course will provide the student with a background in the fundamentals of drug disposition and metabolism. These processes will be common to all drugs and chemicals used therapeutically, in research or in the diet or everyday exposure.

### PHR 412. Systems Pharmacology I. 3 Hours.

This course will introduce the student to the use, mechanism of action and physiological properties of major families of drugs that affect the cardiovascular system, autonomic nervous system (ANS) and central nervous system (CNS). Lectures will provide an overview of nervous system / cardiovascular physiology and pathophysiology that results from various diseases, disorders and injuries, the drugs used to treat these conditions and their mechanisms of action. Both classical drugs and newer classes of drugs will be discussed for both their therapeutic value and also their use in different research settings.

### PHR 413. Systems Pharmacology II. 3 Hours.

This course will introduce drug use, mechanism of action and physiological properties of major drug families, with a focus on specific organ systems (endocrine, gastrointestinal and renal systems). In addition, this course will also cover specific classes of drugs for cancer treatment specifically related to the organ systems covered in the course. This course is divided into three "modules". Each module has its own exam.

### PHR 414. Drug Discovery and Development. 3 Hours.

The course will provide an overview of the drug discovery and development process. Topics will include (among others): Target identification and validation, High-Throughput Screening, Hit discovery, Lead optimization, Preclinical testing, Safety requirements, Clinical trials, IND, NDA, Patents, and Federal regulations. The course will highlight multidisciplinary nature of drug discovery and the roles of biologists, medicinal chemists, pharmacologists, regulatory agencies, and investors in the process. Real-life case stories highlighting successful and unsuccessful drug development examples will be introduced for discussions, as well as some current examples of early stage biotech startups.

### PHR 417. Neuropharmacology. 3 Hours.

This course will introduce the student to the use, mechanism of action, and physiological properties of major families of drugs that affect the autonomic nervous system (ANS) and central nervous system (CNS). Lectures will provide an overview of ANS, CNS, and pharmacology of related diseases. Mechanisms and actions of different drugs used in these systems will be discussed. Both classical and newer classes of drugs will be discussed for their therapeutic value and use in different research settings. This course will be taught using a combination of traditional didactic lectures and student participation through discussions.

### PHR 496. Special Topics. 3 Hours.

Special Topics in Pharmacology.