PHR-Pharmocology

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.
Pharmacology is the study of how drugs/substances interact with living systems. These interactions form the basis of using chemical substances for beneficial therapeutic effects in humans and other animals. The chemical processes induced by drugs often involve drug binding to receptors and subsequent activation/inhibition of normal physiological processes. This course will provide a broad but rigorous overview of pharmacology & toxicology. The content will include the nature of drugs, principles of drug receptors and how drugs work (pharmacodynamics), the fate, disposition and time-course of the drug in the body after administration (pharmacokinetics), chemical modification of the drug by the body (drug metabolism), the influence of genetic differences on drug responses (pharmacogenomics), and the study of the undesirable effects of drugs (toxicology). The student will also learn about the science and processes of drug discovery and development, including drug regulation and regulatory agencies. This course will be of interest and have broad appeal to many science and non-science major students including those preparing for careers in health professions (medicine, pharmacy, nursing, dentistry, optometry, public health), and those who are interested in drug discovery research, chemistry, biology, pharmacology, biochemistry, neurobiology, toxicology, formulations, pharmaceutical industry, FDA, forensic science, toxicology, and microbiology.

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.