PHARMACEUTICAL SCIENCES (PHSC)

PHSC 520 PHARMACEUTICAL BIOCHEMISTRY 3 Credit Hours
An in-depth understanding of topics in Biochemistry of particular interest to the first year Pharm.D. students.
Prerequisite: P-1 standing. Luis Marky, Ph.D.
Typically Offered: SPRING
Capacity: 70

PHSC 550 INTRO PHARMACEUTICAL SCI 4 Credit Hours
Introduction to drug properties, pharmaceutical terminology, drug information, basic clinical skills, principles of chemical kinetics and stability, and acid/base chemistry of drug molecules.
Prerequisite: P-1 standing or permission.
Instructor: Dong Wang, Ph.D.
Typically Offered: FALL
Capacity: 70

PHSC 570 PHARMACEUTICAL SCI I 4-5 Credit Hours
Application of physical pharmacy principles to the development, manufacture, and testing of drug delivery systems, and the influence of physiological factors on the absorption of drugs. The laboratory introduces extemporaneous compounding and the professional aspects of dispensing.
Prerequisite: P-1 standing or permission.
Instructor: Tatiana Bronich, Ph.D.
Capacity: 70

PHSC 610 TREATMENT OF OPHTHALMIC DISEASES 1 Credit Hour
ELECTIVE
Study of the pharmacotherapy of ophthalmic diseases.
Prerequisite: P-2 or P-3 standing.
Instructor: Peter Kador, Ph.D.
Typically Offered: FALL
Capacity: 60

PHSC 626 MEDICINAL CHEMISTRY I 4 Credit Hours
Study of the chemistry, physicochemical properties and relationships between structure and pharmacological activities of organic and inorganic medicinal agents.
Prerequisite: P-2 Standing or permission.
Instructor: Rhongshi Li, Ph.D.
Typically Offered: FALL
Capacity: 60

PHSC 628 MEDICINAL CHEMISTRY II 3 Credit Hours
Study of the chemistry, physicochemical properties and relationships between structure and pharmacological activities of organic and inorganic medicinal agents. Continuation of PHSC 626.
Prerequisite: PHSC 626.
Instructor: Jonathan Vennerstrom, Ph.D.
Capacity: 70

PHSC 670 PHARMACEUTICAL SCI II 3 Credit Hours
Basic principles and concepts of biopharmaceutics, pharmacokinetics, and pharmacodynamics that affect the absorption, distribution, metabolism, elimination and action of drugs in the body. Continuation of PHSC 670.
Prerequisite: P-2 standing or permission.
Instructor: Yazen Alnouti, Ph.D.
Capacity: 70

PHSC 672 PHARMACEUTICAL SCI III 3 Credit Hours
Basic principles and concepts of biopharmaceutics, pharmacokinetics, and pharmacodynamics that affect the absorption, distribution, metabolism, elimination and action of drugs in the body. Continuation of PHSC 670.
Prerequisite: P-2 standing or permission.
Instructor: Yazen Alnouti, Ph.D.
Capacity: 70

PHSC 691 PHARMACEUTICAL SCIENCE APPLICATIONS IN PHARMACY 1 Credit Hour
ELECTIVE
Study of the application of pharmaceutical sciences to pharmacotherapy.
Prerequisite: P-2 or P-3.
Instructor: Tatiana Bronich, Ph.D.
Typically Offered: FALL
Capacity: 60

PHSC 697 INDEPENDENT STUDY I 1-3 Credit Hours
ELECTIVE
Introduction to research involving library, written analysis, data analysis, and/or laboratory study of individually assigned problems.
Prerequisite: Permission.
Instructor: Staff.
Capacity: 30

PHSC 699 RESEARCH in Pharmaceutical Sciences 1-3 Credit Hours
ELECTIVE
Basic or applied laboratory research for students.
Prerequisite: Permission.
Instructor: Staff.
Capacity: 40

PHSC 820 SELECTED TOPICS 1-2 Credit Hours
A detailed study of specific subject areas related to the pharmaceutical sciences. Evaluation and discussion of the scientific literature is an integral part of the course.
Prerequisite: Permission of instructor.

PHSC 821 ORGANIC CHEMISTRY AND APPLICATIONS TO BIOMOLECULES 2 Credit Hours
This course deals with the basic principles to understand the structure, reactivity, and synthesis of bioactive organic molecules. The focus is on the types of key organic reactions used in drug synthesis, mechanism of reactions, scope and limitations of reactions, design of a synthetic route for a bioactive target compound, and application of biocompatible reactions to biomedical systems.
Prerequisite: Permission of instructor.
Typically Offered: FALL

PHSC 825 OPHTHALMIC DRUG DISCOV 3 Credit Hours
A survey of ocular diseases, their pathogenesis, current drug treatment, and approaches to the development of drug treatment. Special methods for the evaluation of ocular drugs as well as use of animal models will be included.
Typically Offered: FALL/SP/SU

PHSC 830 ADV MEDICINAL CHEM 3 Credit Hours
This course will apply essential concepts of medicinal chemistry at an advanced level. Receptor theory, stereochemistry, chemical bonding, and bioisosterism will be discussed as they relate to drug design.
Prerequisite: PHSC 626 (or equivalent).
Typically Offered: FALL/SP/SU
PHSC 843 SPECTRO METHODS ANALYS 3 Credit Hours
This course deals with a theoretical and practical understanding of UV, IR, NMR and MS applied to organic structural elucidation. The advantages, disadvantages, limitations, and appropriate use of each spectroscopic technique will be described.
Prerequisite: First year organic chemistry.
Typically Offered: FALL/SP/SU

PHSC 845 QUANTITATIVE PHARMACEUTICAL ANALYSIS 3 Credit Hours
A lecture and laboratory course covering the theory and applications of current analytical methods for the quantitative determination of drugs, metabolites, and other biologically active agents.
Prerequisite: first year organic chemistry and permission of instructor.
Typically Offered: FALL/SP/SU

PHSC 848 NANOIMAGING/BIOIMAGING 3 Credit Hours
This course will review various nanotechnology approaches to imaging, probing and manipulation at the nanoscale and discuss significance and impact of these technological advances on pharmaceutical and biomedical industries.
Typically Offered: FALL/SP/SU

PHSC 851 INNOVATIVE DRUG DLVRY 3 Credit Hours
This course will examine the innovations in the design, preparation, and evaluation of modern drug delivery systems.
Prerequisite: permission of instructor.
Typically Offered: SPRING

PHSC 852 PHARMACEUTICAL CHEMISTRY FOR DRUG DELIVERY AND NANOMEDICINE 3 Credit Hours
This course will review various chemical reactions and their applications in pharmaceutics, drug delivery and nanomedicine. Practical/laboratory experiments will be included.

PHSC 861 ADV PHARMACOKINETICS 3 Credit Hours
The mathematical description of the rate and extent of drug absorption, distribution, elimination and action.
Prerequisite: PHSC 674 or permission of instructor.
Typically Offered: FALL

PHSC 880 PRINCIPLES AND METHODOLOGIES IN CANCER RESEARCH 2-3 Credit Hours
A survey of the biology and biochemical mechanisms underlying cancer development, prevention, and therapy.
Prerequisite: Permission of instructor.
Cross List: BMB 880, CRGP 880, PAMM 880.
Typically Offered: FALL/SPR

PHSC 885 PHYSICAL PHARMACY 3 Credit Hours
A study of physicochemical principles applicable to drug delivery systems, with emphasis on solubility, diffusion, dispersed systems, and stability testing.
Prerequisite: Permission of instructor.
Typically Offered: FALL

PHSC 890 POLYMER THERAPEUTICS 3 Credit Hours
A study of the physicochemical and biomedical properties of synthetic polymers with an emphasis on their application as modern therapeutics.
Prerequisite: Permission of instructor.
Typically Offered: FALL

PHSC 896 RSCH OTHER THAN THESIS 1-8 Credit Hours
Student research that is clearly distinct from ongoing or planned thesis/dissertation work, or research/lab rotations preformed prior to selecting a permanent advisor or supervisor.
Typically Offered: FALL/SP/SU

PHSC 899 MASTERS THESIS 1-9 Credit Hours
Independent student research related to the masters thesis.
Typically Offered: FALL/SP/ SU

PHSC 902 DRUG DELIVERY AND NANOMEDICINE RESEARCH 3 Credit Hours
This is a webcast seminar course based on the lectures presented by outside and internal faculty speakers in the seminar program of the Center of Drug Delivery and Nanomedicine (CDDN). Videos of these seminars are posted online.
Typically Offered: FALL

PHSC 904 DELIVERY AND BIOCOMPATABILITY OF PROTEIN AND NUCLEIC ACID DRUGS 3 Credit Hours
This course is designed to teach students about the delivery and biocompatibility of proteins, peptides and nucleic acid drugs and dosage form design. Topics will include: biocompatibility, protein and peptide drug delivery, nucleic acid drug delivery, and oligonucleotide, siRNA, shRNA, miRNA, and gene therapy.
Prerequisite: One year of graduate level Medicinal, Physical Chemistry, Bioengineering, Biotechnology.
Typically Offered: FALL/SP/SU

PHSC 905 APPLIED PHARMACogenomics 3 Credit Hours
A 3 credit hour course that integrates physiology, pharmacology, clinical applications, clinical trials,and ethics all in the context of applied pharmacogenomics. Pre-reqs: Completion of a previous pharmacokinetic course or permission from instructor.
Typically Offered: FALL

PHSC 910 PHARMACOKINETICS AND BIOPHARMACEUTICS 3 Credit Hours
This course will address in depth the drug- and body- biopharmaceutical factors that control the absorption, distribution, metabolism, and excretion (ADME) of therapeutic molecules and how they affect the overall pharmacokinetic (PK) profile of these molecules. It will also address the theory and applications of pharmacokinetics in drug discovery and development and its relationship to pharmacodynamics (PD) and toxicity (Tox).
Typically Offered: SPRING

PHSC 920 APPLIED PHARMACOKINETICS IN TRANSLATIONAL RESEARCH AND DRUG DEVELOPMENT 3 Credit Hours
This course introduces and extends key principles and methods for application of pharmacokinetic studies in experimental therapeutics and the drug development process. The format of the course is designed to challenge students to critically think about selected topics in drug disposition, efficacy and toxicity. The course consists of various presentations, lectures, assigned readings and class discussion.
PREREQ: Completion of a basic pharmacoknetics course or PHSC 910
Typically Offered: SPRING

PHSC 921 BIOPHYSICAL CHEMISTRY 3 Credit Hours
The biophysical chemistry of nucleic acids and proteins, including the study of these molecules using NMR, calorimetry and fluorescence.
Prerequisite: Permission of instructor.
Cross List: BMB 921.
Typically Offered: SPRING

PHSC 950 ADVANCED TOXICOLOGY 3 Credit Hours
This course deals with the adverse effects of chemicals on biological systems. Physiological and biochemical mechanisms of toxicity at the cellular and subcellular levels will be emphasized.
Prerequisite: Permission of instructor.
Cross List: ENV 950.
Typically Offered: FALL
PHSC 960 CURRENT TOPICS IN THE PHARMACEUTICAL SCIENCES 1
Credit Hour
This course is mandatory for all students enrolled in the Pharmaceutical Sciences Graduate Program.
Typically Offered: FALL/SPR

PHSC 970 SEMINAR 1 Credit Hour
Attendance at weekly seminars offered by the department/program, or other activities specific to the degree program (contact the program director for more information). This course is mandatory for all pharmaceutical sciences students.
Typically Offered: FALL/SPR

PHSC 999 DOCTORAL DISSERTATION 1-15 Credit Hours
Independent student research related to the PhD dissertation. This course may be utilized before or after successful completion of the comprehensive exam.
Typically Offered: FALL/SP/SU