

# PHARMACEUTICS (PCEU)

## **PCEU 507. Pharmaceutics and Biopharmaceutics I. 2.5-3 Hours.**

Semester course; 2.5-3 lecture hours. 2.5-3 credits. Designed to describe the physico-chemical and biopharmaceutical principles fundamental to the development of pharmaceutical dosage forms. Topics will include solid-, semi-solid and liquid-dosage forms that include solid-state, semi-solid and liquid properties in addition to topics that span these dosage forms including aerosols, drug degradation and stability, shelf-life, packaging, and control of pharmaceutical ingredients.

## **PCEU 508. Pharmacokinetics. 3 Hours.**

Semester course; 3 lecture hours. 3 credits. Prerequisite: PCEU 507. Corequisite: PCEU 509. Major topics include the mathematical and physiological principles of pharmacokinetics related to the development and use of pharmaceutical dosage forms. Discussions will include compartmental modeling, physiological concepts of pharmacokinetics, and clearance and absorption concepts. Also includes material related to statistics.

## **PCEU 509. Pharmaceutics and Biopharmaceutics II. 3 Hours.**

Semester course; 3 lecture hours. 3 credits. Prerequisite: PCEU 507. Designed to describe the biopharmaceutical principles fundamental to the development of pharmaceutical dosage forms, including parenteral products, solutions, disperse systems, semisolids, solids and novel drug delivery systems. The formulation, manufacture, control, biopharmaceutics and relevant patient-pharmacist interactions of the major dosage forms will be addressed and presented by route of administration.

## **PCEU 601. Applied Pharmacokinetics and Pharmacogenomics. 2.5 Hours.**

Semester course; 2.5 lecture hours. 2.5 credits. Extends the concepts of pharmacokinetics as applied to physiological interpretation of pharmacokinetic properties and parameters, optimal dosage regimen design, pharmacokinetic variability in drug response, and drug interactions. Pharmacodynamic and pharmacogenomic principles include interpretation of genetic information and application to information in therapeutic decision-making.

## **PCEU 604. Molecular Pharmaceutics. 3 Hours.**

Semester course; 3 lecture hours. 3 credits. Prerequisite: permission of course coordinator. The student's basic biochemistry and pharmacy education will be expanded with emerging molecular concepts in enzyme and transporter structure and function, roles in drug disposition, pharmacogenomics, biochemistry, molecular biology, and experimental techniques.

## **PCEU 612. Advanced Physical Pharmacy and Biopharmaceutics. 3-5 Hours.**

Semester course; 3 credits. Phase equilibria and phase transfer kinetics related to biopharmaceutics will be covered. The relationship between physiochemical properties of a drug dosage form and drug absorption, along with the correlation between in vitro tests used to evaluate dosage forms and in vitro measures of drug absorption will be covered. The course assumes that the student has a basic understanding of pharmacokinetics, physical chemistry and statistics.

## **PCEU 614. Research Techniques. 1-4 Hours.**

Semester course; variable hours. Variable credit. Credit will be given on the basis of 1 credit per 45 hours of laboratory time. Prerequisite: approval of research adviser. Provides new graduate student with the laboratory skills necessary to perform research in the chosen discipline. The training time required will depend upon the discipline. Graded as pass/fail. Crosslisted as: MEDC 614/PHAR 614.

## **PCEU 615. Applied Pharmacokinetics. 2.5 Hours.**

Semester course; 2.5 lecture hours. 2.5 credits. Extends the concepts of pharmacokinetics as applied to dosage regimen design, pharmacokinetic variability, drug interactions and statistical strategies for individualization of drug therapy. Lectures and conferences take place throughout the semester.

## **PCEU 621. Advanced Pharmaceutics and Drug Disposition. 3 Hours.**

Semester course; 3 lecture hours. 3 credits. Study at the advanced level of the relationships between the physiochemical properties of a drug and dosage form and the absorption, distribution, elimination and pharmacological effects of the drug. Current theory and methodology involved in solving problems at the research level are emphasized.

## **PCEU 622. Clinical Pharmacokinetics. 3 Hours.**

Semester course; 2 lecture and 2 laboratory hours. 3 credits. The application of current pharmacokinetic theory to clinical problems involved in optimizing and monitoring drug use in patients. Particular attention is given to adjustment of drug dosage in individual patients with impaired drug elimination due to renal and hepatic dysfunction. (Nontraditional program).

## **PCEU 624. Advanced Pharmacokinetics. 3 Hours.**

Semester course; 3 lecture hours. 3 credits. An advanced treatment of the kinetics of drug absorption, distribution, and elimination utilizing mathematical models, and digital computers for analysis of linear and nonlinear biologic systems.

## **PCEU 625. Pharmaceutical Analysis. 4 Hours.**

Semester course; 3 lecture and 1 laboratory hours. 4 credits. Theory and practice of selected analytical techniques for the quantitative analysis of drugs in body fluids and other matrices. Emphasis is on method validation, and immunoassay methodologies. Laboratory sessions will provide "hands on" experience with modern methods of drug analysis.

## **PCEU 626. Pharmaceutical Analysis Laboratory. 1 Hour.**

1 lecture hour. 1 credit. Prerequisite: PHAR 625. A continuation of PHAR 625 with emphasis on providing advanced topics for analysis of drugs and metabolites.

## **PCEU 675. Proteomics. 3 Hours.**

Semester course; 3 lecture hours. 3 credits. Enrollment is restricted to graduate students, but senior-level undergraduate students in STEM majors will be considered on an individual basis. Introductory course in proteomics with an emphasis on mass spectrometry-based measurements including protein identification, quantification and post-translational modifications. The course will cover essential mass spectrometry instrumentation and separation science fundamentals, sample preparation, protein identification, protein quantification, post-translational modification enrichment strategies, and data analysis. Contemporary applications of proteomics in biology and biomedicine will be covered.

## **PCEU 690. Pharmaceutics Research Seminar. 1 Hour.**

Semester course; 1 lecture hour. 1 credit. Required of all graduate students in pharmaceutics. Research Seminar.

**PCEU 691. Special Topics in Pharmaceutics. 1-5 Hours.**

Semester course; 1-5 lecture hours. 1-5 credits. Presentation of subject matter is by lectures, tutorial studies, and/or library assignments in selected areas of advanced study not available in other courses or as part of the training in research.

**PCEU 697. Directed Research in Pharmaceutics. 1-15 Hours.**

Semester course; 1-15 credits. Research leading to the M.S., Pharm.D., or Ph.D. degree.