

## Pharmaceutics

- Research in pharmaceutics involves all aspects of design, development, and evaluation of effective dosage forms/delivery systems, and entails one or more interdisciplinary areas that include physical pharmacy, pharmaceutical analysis, drug delivery, biopharmaceutics, and pharmacokinetics.
- Study in physical pharmacy includes equilibria, complexation, preformulation stability of liquid and solid formulations, solubility, surface chemistry, diffusion and mass transport.
- Study in pharmaceutical analysis includes spectroscopy, chromatography, extraction, and radio labeled assays.
- Research in drug delivery involves physical and chemical approaches to deliver drug molecules to selected organs and tissues, and evaluation of drug delivery systems using in vitro models.
- Research in biopharmaceutics considers the interrelationship of the physicochemical properties of drugs, the dosage form in which the drug is given, and the route of administration on the rate and extent of systemic drug absorption.
- Study in pharmacokinetics deals with the time course of drug absorption, distribution, metabolism, and excretion.
- Research in these areas offers interdisciplinary framework and provides comprehensive programs of course work leading to M.S. and Ph.D. degrees. The areas of specialization within pharmaceutics may range from strongly physicochemical to highly biological in orientation. The overall objective of our program is to educate and train individuals capable of conducting independent research with specialized knowledge in one of the above areas.

Faculty with an interest in Pharmaceutics:

- Dr. Michael DeGennaro, Assistant Professor of Pharmaceutics
- Dr. Sami Nazzal, Assistant Professor of Pharmaceutics
- Dr. Alamdar Hussain, Assistant Professor of Pharmaceutics
- Dr. Amal Khalil Kaddoumi, Assistant Professor of Pharmaceutics

### Required Courses for Pharmaceutics

Chemistry 4001	Physical Chemistry
Chemistry 4007	Instrumental Analysis
Math 4001	Differential Equations
Math 5020 and 5021	Statistical Methods for the Experimenter
Pharmacy 5013	Pharmacokinetics
Pharmacy 5014	Advanced Biopharmaceutics
Pharmacy 5077	Pharmaceutical Preformulations
Pharmacy 5078	Solid State Chemistry of Drugs
Pharmacy 5079	Pharmaceutical Dosage Form Design
Pharmacy 5083	Surface and Interfacial Phenomena
Pharmacy 5084	Chemical Kinetics and Stability of Pharmaceuticals

### Additional Courses for Doctor of Philosophy (Ph.D.) Degree:

Chemistry 4002	Physical Chemistry
Pharmacy 5066	Advanced Medicinal Analysis
Pharmacy 5068	Advanced Medicinal Analysis Lab
Math 5022	Multivariate Statistical Methods for Researchers
Math 4005	Partial Differential Equations