

## Pharmaceutical Sciences Graduate Courses

### **PHSC 7310 Fundamentals of Pharmaceutical Sciences 3.0 cr.**

Fall and Spring Crosslisted TXCL 7310

Core course explores key aspects of Pharmaceutical Sciences. Major themes will focus on macromolecular interactions, pharmaceutics, pharmacokinetics, pharmacodynamics, apoptosis, signal transduction and immunology. Critical thinking and problem solving skills will be emphasized via lectures, discussions and computer-based data analysis.

### **PHSC 7320 Physical Pharmacy and Pharmaceutical Sciences 3.0 cr.**

Spring semester Crosslisted TXCL 7320

This course was designed to provide students with a thorough overview of physical chemical principles vital to Pharmaceutical Sciences; a course for someone whose research efforts will involve pharmaceutical development and/or the evaluation of drugs.

### **PHSC 7330 Development of Drugs and Biologics 3.0 cr.**

alternating Spring semesters Prereq: Permission from instructor.

This will be a survey course designed to introduce students to pharmacokinetic and pharmacodynamics principles used in drug research and development. The Phoenix Winnonlin Computer software, a pharmaceutical industry standard, will be used in the course to complete the homework assignments.

### **PHSC 7345 Nanotechnology and Drug Delivery 2.0 cr.**

(Spring) Prereq: Student should be enrolled in a graduate or equivalent program.

Course presents physicochemical and biological principles of drug delivery including drug delivery system design for various applications. In addition, it will address principles of nanotechnology related to the design of nanosize delivery systems intended for drug delivery, imaging and diagnosis.

### **PHSC 7350 Proteins 3.0 cr.**

Structural Biology & Biochemistry Faculty / Pharmaceutical Sciences Faculty – (Spring) Crosslisted: STBB 7350. Chemical and physical basis for protein structure, folding, function and stability; role of molecular dynamics, use of molecular simulations in investigations of protein-ligand and protein interactions; methods and principles of protein/peptide purification and enzyme catalysis, including electron transfer and mutagenesis.

### **PHSC 7354 Structural Analysis of BioMolecules I 2.0 cr.**

Structural Biology & Biochemistry Faculty / Pharmaceutical Sciences Faculty – (Spring) Crosslisted: STBB 7354

This course describes the fundamentals of spectroscopic methods used to study protein structure and function. These techniques include optical methods (CD spectroscopy, fluorescence and absorbance), vibrational methods (IR and ESR), analytical ultracentrifugation, mass spectrometry, calorimetry, light scattering and Biacore analysis.

### **PHSC 7400 Ethical Issues in Toxicology & Pharmaceutical Sciences 1.0 cr.**

Pharmaceutical Sciences Faculty - (Fall) Crosslisted: TXCL 7400.

The purpose of this course is to expose students to ethical issues in the fields of toxicology and pharmaceutical sciences. Emphasis will be placed on research conduct, animal use, and other timely issues relevant in these fields.

### **PHSC 7454 Structural Analysis of Biomolecules 2 2.0 cr.**

Structural Biology & Biochemistry Faculty / Pharmaceutical Sciences Faculty – (Spring) Crosslisted: STBB 7454.

Methods and strategies for determination of the primary and 3-dimensional structures of biologically important molecules. Crystallography, nuclear magnetic resonance spectroscopy and mass spectrometry will be taught in structural determination of proteins, nucleic acids complex carbohydrates, and lipid molecules

### **PHSC 7568 Seminar in the Pharmaceutical Sciences 1.0-3.0 cr.**

Fall and Spring semesters

Discusses current literature and research in the pharmaceutical sciences. The only revision for this course is that the maximum credit hours possible will be three.

### **PHSC 7608 Molecular Interactions 3.0 cr.**

Structural Biology & Biochemistry Faculty / Pharmaceutical Sciences Faculty – (Spring) Crosslisted: STBB 7608.

Chemical and physical basis for protein structure, folding, function and stability; role of molecular dynamics, use of molecular simulations in investigations of protein-ligand and protein interactions; methods and principles of protein/peptide purification and enzyme catalysis, including electron transfer and mutagenesis.

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### **[PHSC 7609 BioPhysics & Spectroscopy 3.0 cr.](#)**

Structural Biology & Biochemistry Faculty / Pharmaceutical Sciences Faculty – (Spring) Crosslisted: STBB 7609.  
This course will teach fundamentals of modern molecular spectroscopies and biophysical techniques as applied to biomolecules and the structural/dynamic information they afford.

### **[PHSC 7650 Research Rotation in the Pharmaceutical Sciences 1.0-10.0 cr.](#)**

Pharmaceutical Sciences Faculty - (Fall, Spring, Summer) Prereq: Consent of instructor.  
Research work in pharmaceutical sciences.

### **[PHSC 7651 Pharmaceutical Biotechnology 3.0 cr.](#)**

Fall of Spring semester Crosslisted: CU Boulder CHEN 5900.

Course covers role of bioengineering in development of pharmaceutical biotechnology products.

In particular, the student will learn to apply solution thermodynamics as well as mass and heat transfer concepts to the stabilization/formulation of macromolecules and production of drug delivery systems.

### **[PHSC 7653 Protein Formulation 2.0 cr.](#)**

Spring semester

This course will provide instruction in rational design of stable therapeutic protein formulations with emphasis on the practical and mechanistic aspects of developing aqueous solution and freeze-dried formulations. Students will read papers from the literature and participate in critical discussions.

### **[PHSC 7658 Advanced Topics in Pharmaceutical Sciences 1.0-5.0 cr.](#)**

Summer semester Prereq: Permission from instructor

Considers special topic of current interest in pharmaceutical sciences. Course may be repeated for credit with instructor's approval.

### **[PHSC 7660 Membrane Dynamics 2.0 cr.](#)**

Spring semester

This literature-based course briefly reviews the fundamental physicochemical characteristics of lipid membranes and then rigorously discusses how these properties are exploited for drug delivery. This course focuses on how current liposome technology overcomes the barriers to successful delivery.

### **[PHSC 7665 Pharmacokinetic Principles and Applications 3.0 cr.](#)**

Alternating Spring semesters

This will be a survey course designed to introduce students to pharmacokinetic and pharmacodynamics principles used in drug research and development. The Phoenix Winnonlin Computer software, a pharmaceutical industry standard, will be used in the course to complete the homework assignments.

### **[PHSC 8990 Doctoral Thesis 1.0-10.0 cr.](#)**

Pharmaceutical Sciences Faculty - (Fall, Spring, Summer) Prereq: Consent of instructor.

Doctoral thesis work in pharmaceutical sciences.