

# TOXICOLOGY (TXCL)

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## TXCL 7310 - Fundamentals of Pharmaceutical Sciences I (3 Credits)

This core course explores key aspects of Pharmaceutical Sciences. Major themes will focus on macromolecular interactions, pharmaceuticals, pharmacodynamics, apoptosis, signal transduction and immunology. Critical thinking and problem solving skills will be emphasized via lectures discussion, and computer-based data analyses. Crosslisted: PHSC 7310.

Grading Basis: Letter Grade

A-GRAD Restricted to graduate students only.

Typically Offered: Fall.

## TXCL 7312 - Fundamentals Doctoral Recitation I (1 Credit)

This is a one-credit course that is designed to complement TXCL 7310 (Fundamentals). While the didactic lectures of Fundamentals are essential for foundational knowledge in Toxicology and the Pharmaceutical Sciences, this course provides an opportunity for and detailed discussion of experimental design and data interpretation. Intended to be taken the same semester as TXCL 7310 but can be taken alone by PHSC-MS students who've been admitted to the TXCL-PhD program.

Grading Basis: Letter Grade with IP

Repeatable. Max Credits: 1.

A-GRAD Restricted to graduate students only.

Typically Offered: Fall, Spring.

## TXCL 7315 - Fundamentals of Pharmaceutical Sciences II (3 Credits)

Core course explores key aspects of Pharmaceutical Sciences. Major themes will focus on drug delivery and imaging systems, protein therapeutics, and the drug discovery process. Critical thinking and problem solving skills will be emphasized via lectures, discussions and computer-based data analyses. Crosslisted with TXCL 7315.

Grading Basis: Letter Grade

Repeatable. Max Credits: 3.

A-GRAD Restricted to graduate students only.

Typically Offered: Spring.

## TXCL 7317 - Fundamentals Doctoral Recitation II (1 Credit)

This is a one-credit course designed to complement TXCL 7315. While the didactic lectures of Fundamentals are essential for foundational knowledge in Toxicology and the Pharmaceutical Sciences, this course provides an opportunity for analytical and critical thinking and detailed discussion of experimental design and data interpretation. Intended to be taken the same semester as TXCL 7315 but can be taken alone by PHSC-MS students who've been admitted to the PHSC-PhD program.

Grading Basis: Letter Grade

Repeatable. Max Credits: 1.

A-GRAD Restricted to graduate students only.

Typically Offered: Spring.

## TXCL 7320 - Physical Pharmacy & Pharmaceutical Sciences (3 Credits)

This course is 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. Cross listed with PHSC 7320.

Grading Basis: Letter Grade

A-GRAD Restricted to graduate students only.

Typically Offered: Spring.

## TXCL 7321 - Careers in Toxicology (1 Credit)

This course builds upon and expands student knowledge relating to career trajectories within the toxicological sciences. Knowledge and experiences gained from this course will enable the student to make a more informed decision regarding the career choices available to them.

Grading Basis: Letter Grade

A-GRAD Restricted to graduate students only.

Typically Offered: Spring.

## TXCL 7322 - Molecular and Target Organ Toxicology (3 Credits)

This course is designed to provide a foundation in molecular mechanisms of toxicity. Biochemical mechanisms underlying toxicity will be analyzed and integrated with discussions of reactive metabolites, oxidative stress, signal transduction, cell death and organ specific toxicity. Prereq: Discussion with and consent of instructor.

Grading Basis: Letter Grade

A-GRAD Restricted to graduate students only.

Typically Offered: Fall.

## TXCL 7323 - Environmental and Target Organ Toxicology (3 Credits)

The course is designed to provide a fundamental understanding of environmental-related toxicants (e.g. solvents, pesticides, metals, radiation) with emphases on the molecular mechanisms underlying their organ specific toxicity and on risk assessment. Prereq: Discussion with and consent of instructor.

Grading Basis: Letter Grade

A-GRAD Restricted to graduate students only.

Typically Offered: Spring.

## TXCL 7325 - Current Topics in Toxicology Research (1 Credit)

This is a mandatory 2-credit hour course for Toxicology program PhD students and MS in Pharmaceutical Sciences students in the Molecular & Systems Toxicology track. Each student is expected to lead one discussion per year, papers discussed will be authored by the upcoming Toxicology seminar series speaker. Grade given after Spring semester. Requisites: Required attendance at all seminars in the Dept. of Pharmaceutical Sciences (DOPS) Graduate Program Seminar Series.

Grading Basis: Letter Grade with IP

Repeatable. Max Credits: 15.

A-GRAD Restricted to graduate students only.

Typically Offered: Fall, Spring.

## TXCL 7330 - Development of Drugs and Biologics (3 Credits)

A survey course designed to introduce students to pharmacokinetic and pharmacodynamics principals used in drug research and development by faculty of the Skaggs School of Pharmacy, Department of Pharmaceutical Sciences. The Phoenix Winnonlin Computer software, is used to complete homework. Offered in Fall of odd-numbered years. Crosslisted with PHSC 7330.

Grading Basis: Letter Grade

A-GRAD Restricted to graduate students only.

Typically Offered: Fall.

## TXCL 7353 - Immunology: Immunotoxicology and Immunopharmacology (2 Credits)

This course is designed to introduce students to basic immunology principles used in drug research and development, and provide essential knowledge on the immune response, its diagnosis and its modification by drugs and chemicals.

Grading Basis: Letter Grade

Typically Offered: Fall.

**TXCL 7400 - Ethical Issues in Toxicology and Pharmaceutical Sciences (1 Credit)**

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 to these fields.

Grading Basis: Letter Grade

Repeatable. Max Credits: 2.

A-GRAD Restricted to graduate students only.

Typically Offered: Fall.

**TXCL 7452 - Introduction to Clinical Pharmacology (3 Credits)**

The course provides students with a foundational knowledge of clinical pharmacology, including pharmacokinetics, drug metabolism, assessment of drug effects, optimizing patient therapy and drug discovery and development. It is grounded in weekly topical lectures, supplemented by readings, discussion and assignments. Prerequisite: Permission of Course Director. (crosslisted with PHSC 7452)

Grading Basis: Letter Grade

A-GRAD Restricted to graduate students only.

Typically Offered: Fall, Spring.

**TXCL 7475 - Advanced Topics in Toxicology (1-6 Credits)**

Considers special topic of current interest in toxicology. Course may be repeated for credit with instructor's consent. Prereq: Consent of Instructor/Program Director.

Grading Basis: Letter Grade

Repeatable. Max Credits: 13.

Typically Offered: Fall.

**TXCL 7564 - Environmental Risk Assessment and Applied Toxicology (2 Credits)**

Provides students with experience in risk assessment, environmental toxicology for public health and regulatory decision making. Topics include comprehensive human health risk assessments, baseline/probabilistic statistics, ecological risk assessment activities associated with emergency action, medical monitoring, role toxicology plays in courtroom.

Grading Basis: Letter Grade

Typically Offered: Spring.

**TXCL 7565 - Applied Statistics for Pharm Science and Toxicology (2 Credits)**

Students will learn several basic statistical techniques for analyzing data including when and how to use them, the appropriate assumptions for these methods, and how to clearly articulate their statistical results in the context of toxicology and pharmaceutical sciences studies. Prerequisite: Pharmaceutical Sciences and Toxicology graduate students

Grading Basis: Letter Grade

A-GRAD Restricted to graduate students only.

Typically Offered: Fall.

**TXCL 7650 - Research Rotation in Toxicology (1-5 Credits)**

Research work in toxicology.

Grading Basis: Letter Grade with IP

Repeatable. Max Credits: 10.

A-GRAD Restricted to graduate students only.

Typically Offered: Fall, Spring, Summer.

**TXCL 7665 - Pharmacokinetic Principles & Applications (3 Credits)**

A survey course to introduce students to pharmacokinetic and pharmacodynamics principles used in drug research and development.

Taught by faculty from the School of Pharmacy, Department of Pharmaceutical Sciences. Phoenix Winnonlin Computer software will be used in the course. Cross-listed with PHSC 7665

Grading Basis: Letter Grade

Typically Offered: Spring.

**TXCL 7750 - Proteomics & Metabolomics for Biomarker Discovery (3 Credits)**

An introduction to mass spectrometry followed by a focus on quantitative metabolomics or proteomics workflows. Workflows comprise sample preparation, data acquisition, and data analysis. Additional topics include imaging mass spectrometry, lipidomics, post-translational modification analysis, and clinical applications. Offered odd years.

Grading Basis: Letter Grade

A-GRAD Restricted to graduate students only.

Typically Offered: Fall.

**TXCL 7751 - Neurotoxicology (2 Credits)**

Neurotoxicology offers a specialization in neuroscience-related toxicology; Topics (basic and applied) include: neuropharmacology (affect of ethanol/drugs), neurophysiology (metabolic poisons), developmental neurotoxicology (pesticides and neurodevelopmental disorders, radiation), and behavioral toxicology (cognitive function).

Grading Basis: Letter Grade

Typically Offered: Spring.

**TXCL 8990 - Doctoral Thesis (1-10 Credits)**

Doctoral thesis work in toxicology. Prereq: Consent of the instructor.

Grading Basis: Letter Grade with IP

Repeatable. Max Credits: 10.

A-GRAD Restricted to graduate students only.

Additional Information: Report as Full Time.

Typically Offered: Fall, Spring, Summer.