DEPARTMENT OF PHARMACOLOGY AND EXPERIMENTAL THERAPEUTICS

Pharmacology is the science that deals with the origin, nature, chemistry, effects, and uses of drugs; it includes pharmacokinetics, pharmacodynamics, pharmacotherapeutics, and toxicology. Pharmacology addresses the study of drugs in all aspects: their properties and reactions with relation to therapeutic value, as well as the discovery, biological/physiological effects other than therapeutic effects (adverse reactions and side effects), and uses. This science also addresses the body's effects on drugs, including absorption, distribution, metabolism and excretion of drugs.

ABOUT THE DEPARTMENT OF PHARMACOLOGY & EXPERIMENTAL THERAPEUTICS

The Department of Pharmacology and Experimental Therapeutics seeks to integrate both basic and applied research in the pharmaceutical sciences into the academic programs in order to provide students with the information they need to be successful in the challenging fields of pharmacy and the pharmaceutical industry.

The Department of Pharmacology and Experimental Therapeutics contributes to the training of students in the Doctor of Pharmacy and B.S. in Pharmaceutical Sciences (BSPS) programs, with extensive training offered to students in the Pharmacology/Toxicology major of the B.S. in Pharmaceutical Sciences program. The department also offers a master's in Pharmaceutical Sciences with a concentration in Pharmacology/Toxicology, a B.S./M.S dual degree in Pharmacology/Toxicology, and a Ph.D. in Experimental Therapeutics.

Departmental courses cover a broad range of disciplines, including a series of pharmacology, toxicology, and pharmacokinetics/toxicokinetics courses and many other courses in experimental therapeutics at the graduate level. The department's faculty members have research interests in neuro- and molecular pharmacology, drug metabolism, polycystic kidney disease, zebrafish as a model for drug testing, and toxicology.

CONTACT US

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Degrees Offered

Doctor of Philosophy in Experimental Therapeutics (https://catalog.utoledo.edu/graduate/pharmacy-pharmaceutical-sciences/departments-programs/pharmacology/phd-experimental-therapeutics/)

Master of Science in Pharmaceutical Sciences Pharmacology/Toxicology (https://catalog.utoledo.edu/graduate/pharmacy-pharmaceutical-sciences/departments-programs/pharmacology/msps-pharmacology-toxicology/#text)

Combined Degree Programs

PharmD/Doctor of Philosophy in Experimental Therapeutics Dual Degree (https://catalog.utoledo.edu/graduate/pharmacy-pharmaceutical-sciences/departments-programs/combined-pharmd-phd-medicinal-chemistry/)

Bachelor of Science in Pharmaceutical Sciences (Pharmacology/Toxicology) and Master of Science in Pharmaceutical Sciences / Pharmacology Toxicology (BSPS/MS) combined 5-year option (https://catalog.utoledo.edu/graduate/pharmacy-pharmaceutical-sciences/departments-programs/pharmacology/msps-pharmacology-toxicology/)

Bachelor of Science in Pharmaceutical Science/ M.S. Law combined 5-year option (https://catalog.utoledo.edu/graduate/pharmacy-pharmaceutical-sciences/departments-programs/pharmacology/msps-pharmacology-toxicology/#text)

Certificates

Cosmetic Formulation Design, Graduate Certificate (https://catalog.utoledo.edu/graduate/pharmacy-pharmaceutical-sciences/departments-programs/pharmacology/graduate-certificate-cosmetic-formulation-design/)

PHCL 5100 Experimental Therapeutics I
[3 credit hours]
The course will cover the application of basic principles of pharmacology to the development of new therapies for human disease. A primary focus will be the translation of laboratory discoveries into clinical applications.
Prerequisites: PHCL 3700 with a minimum grade of B- or PHCL 5700 (may be taken concurrently) with a minimum grade of B-
Term Offered: Fall

PHCL 5200 Experimental Therapeutics II
[3 credit hours]
The course will expand upon material covered in Experimental Therapeutics I and focus on the drug development process. Practical applications include the design of in vitro and in vivo screens for drug activity, improvement of pharmacokinetic properties and integration of medicinal chemistry with pharmacology in a drug development paradigm.
Prerequisites: PHCL 5100 with a minimum grade of B-
Term Offered: Spring

PHCL 5440 Current Topics in Interpretation of Pharmaceutical Data
[1 credit hour]
The basic statistical techniques learned in PHCL 5140 will be further explored using research articles and real data sets to conduct statistical analyses. The use of different software programs will be used to provide students with hands-on practice in conducting statistical analyses.
Prerequisites: PHCL 5140 (may be taken concurrently) with a minimum grade of B-
Term Offered: Summer

PHCL 5460 Current Topics in Pharmacokinetics Toxicokinetics
[1 credit hour]
An advanced discussion of the theory and practice of using kinetic principles to model the time course of drugs and toxic chemicals in the body and in the environment. The student should understand the relationship between chemical time courses and outcomes and application to risk assessment. Additionally, students will gain hands-on practice using kinetic analysis methods and software.
Prerequisites: PHCL 4760 with a minimum grade of B- or PHCL 5760 (may be taken concurrently) with a minimum grade of B-
Term Offered: Spring, Fall

PHCL 5500 From Experimental to Applied Therapeutics
[4 credit hours]
The course focuses on bridging the gap between experimental and clinical applications of drugs. It will discuss groups of structurally related drugs designed to treat certain conditions, their basic molecular pharmacological action and how that is applied clinically. The course will also include discussing toxicity of some drugs and xenobiotics manufactured for certain applications, their basic molecular actions and their clinical toxicity.
Prerequisites: PHCL 3700 with a minimum grade of B- or PHCL 5700 (may be taken concurrently) with a minimum grade of B-
Term Offered: Fall

PHCL 5700 Pharmacology I: Principles of Pharmacology, Autonomic Pharmacology and Related Pharmacology
[3 credit hours]
An introduction to the principles of pharmacology and the pharmacology of the autonomic nervous system."
Term Offered: Fall

PHCL 5720 Pharmacology II: Endocrine And Cns Pharmacology
[3 credit hours]
The pharmacology of drugs acting upon the endocrine and reproductive systems will be discussed, followed by a treatment of drugs used in the management of sleep disorders, anxiety, affective illness, schizophrenia and seizure disorders.
Prerequisites: PHCL 3700 with a minimum grade of B- or PHCL 5700 with a minimum grade of C
Term Offered: Spring

PHCL 5730 Principles and Systems Toxicology
[3 credit hours]
This course reviews the basic elements of toxicology. It includes those principles most frequently involved in a full understanding of toxicologic events, such as dose-response, lethal dose-50 (LD50) and margin of safety. It also identifies toxic chemicals and their systemic sites and mechanisms of action. Finally, this course provides information about the kinds of toxic injuries produces in specific organs or systems and the toxic agents that produce these effects. Information about the possible management of some cases of intoxication or poisonings by some agents will be briefly reviewed.
Term Offered: Fall

PHCL 5750 Toxicology II
[3 credit hours]
This course provides the students with an overview of environmental toxicology, which emphasizes both air and water pollution. It also reviews the applications of different areas of toxicology, such as food toxicology emphasizing the safety standards of food and methods of evaluation of food safety, analytic toxicology and its applications in forensic toxicology, and occupational toxicology, emphasizing the health effects of industrial chemicals on workers. General methodologies for toxicity testing are also discussed.
Prerequisites: PHCL 3700 with a minimum grade of B- or PHCL 5700 with a minimum grade of C
Term Offered: Spring

PHCL 5760 Toxicokinetics
[3 credit hours]
This course introduces the student to basic concepts involved in the absorption, distribution, metabolism, and elimination of medications in the body. The dynamics of various pharmacokinetic processes will be expounded by means of various parameters and models. The student will apply mathematical formalisms to calculate various pharmacokinetic parameters to further formulate and design individualized dosage regimens.
Term Offered: Spring, Summer, Fall

PHCL 5770 Current Topics in Toxicology I
[1 credit hour]
The course focuses on the most recently published studies that cover advances in the field of toxicology, including risk assessment of toxic chemicals, toxicokinetics, chemically ¿induced mutations, cancer and developmental toxicity, toxic responses of various body systems to different chemicals and drugs, toxicity of pesticides and heavy metals.
Prerequisites: PHCL 4730 with a minimum grade of B- or PHCL 5730 (may be taken concurrently) with a minimum grade of B-
Term Offered: Fall

PHCL 5800 Principles and Methods of Forensic Toxicology
[3 credit hours]
Introduction to the goals and methods of forensic toxicology, including post-mortem forensic toxicology, human performance forensic toxicology, and forensic toxicology testing. Introduction to the general methods used to analyze different types of sample types and analytes in forensic toxicology.
Term Offered: Spring, Summer, Fall

PHCL 5810 Laboratory Quality Assurance and Quality Control
[3 credit hours]
This course teaches the principles of quality assurance and quality control as they apply to the laboratory sciences. These approaches include standards and controls, written procedures, and method validation used in biological, pharmacological, toxicological and forensic sciences.
Term Offered: Spring, Summer, Fall

PHCL 5990 Problems In Pharmacology
[1-6 credit hours]
Tutorial or directed individual research in pharmacology.
Term Offered: Spring, Summer, Fall

PHCL 6160 Biopharmaceutics & Pharmacokinetics
[3 credit hours]
This course will provide the theoretical basis and clinical application of pharmacokinetics as relates to drug dosing, absorption, distribution, biotransformation, and excretion.
Term Offered: Spring

PHCL 6300 Research Experience in Experimental Therapeutics
[2-6 credit hours]
The course is intended for laboratory rotations to familiarize students with research topics in various clinical/basic science laboratories. A primary focus is to allow students to shadow, learn, experience and perform specific laboratory techniques.
Term Offered: Spring, Summer, Fall

PHCL 6320 NEUROLOGICAL AND PSYCHIATRIC PHARMACOLOGY
[1 credit hour]
A course analyzing the pharmacology of neurologically based attributes and disorders.
Corequisites: MBC 6320, PHPR 6140
Term Offered: Spring

PHCL 6390 Problems in Experimental Therapeutics
[1-6 credit hours]
The course will examine current topics and trends in the field of experimental therapeutics. The nature of the course will vary from student to student, depending on their background in the field, and the nature of their interest. For example, a new student may be assigned a literature search to identify papers that describe current approaches toward the treatment of human disease. A more advanced student might be given the task of researching and developing new laboratory techniques to initiate a research project. The overall goal will be to introduce students to current problems in experimental therapeutics, and help them identify an approach toward solving these problems.
Term Offered: Spring, Summer, Fall

PHCL 6400 Cannabis Science – Risks & Benefits
[3 credit hours]
Cannabis Science – Risks and Benefits – delves into the pharmacology, biochemistry, pharmacokinetics, and toxicology of cannabis products. The course will also cover the neuropsychopharmacology of cannabis and the effects of short term and long term uses of cannabis in the central nervous and peripheral systems.
Term Offered: Spring, Fall

PHCL 6600 Seminar In Pharmacology
[1 credit hour]
Pharmacology students will attend seminar presentations offered in the departments of , and must present at least one seminar.
Term Offered: Fall

PHCL 6650 Seminar in Experimental Therapeutics
[2 credit hours]
The course includes seminars presented by scientists from academia, industry and government who are invited by the department to speak about their research. Research subjects to be covered by the seminars are within the field of therapeutics and related areas, such as toxicology, molecular and genetic mechanisms in drug/chemical action, risk assessment, biomarkers and others.
Term Offered: Spring, Fall

PHCL 6700 Pharmacology III: Cns And Cardiovascular/Renal Pharmacology
[3 credit hours]
The pharmacology of central nervous system active agents . Agents acting on the cardiovascular and renal systems are discussed.
Prerequisites: PHCL 3700 with a minimum grade of B- or PHCL 5700 (may be taken concurrently) with a minimum grade of C
Term Offered: Fall

PHCL 6710 Fundamentals of Biostatistics and Research Analysis
[3 credit hours]
This course discusses biostatistical analysis, evaluation of peer-reviewed literature, and interpreting research concepts, methods, data, and outcomes in preparation for the cosmetic science project.
Term Offered: Summer, Fall

PHCL 6720 Pharmacology IV; Chemotherapeutics
[3 credit hours]
The pharmacology of anti-infective chemotherapeutic agents is presented. Issues such as the mechanism of antimicrobial action, disposition, resistance and problems attending the use of antimicrobial drugs will be discussed.
Prerequisites: PHCL 3700 with a minimum grade of B- or PHCL 5700 with a minimum grade of C
Term Offered: Spring

PHCL 6800 Drug Metabolism and Molecular Toxicology
[3 credit hours]
This course teaches the principles of molecular toxicology and considers how drug metabolism produces and limits toxicity. Mechanism of biotransformation of drugs and other xenobiotics, and the contributions of these mechanisms to drug toxicity are explored
Term Offered: Spring, Summer, Fall

PHCL 6810 Forensic Toxicology and the Law
[3 credit hours]
Consideration of the legal principles and procedures underlying the application of forensic toxicology.
Term Offered: Spring, Summer, Fall

PHCL 6820 Forensic Toxicology Capstone
[3 credit hours]
In this capstone course for the MS in forensic toxicology students will research a topic of interest under the direction of a faculty mentor.
Term Offered: Spring, Summer, Fall

PHCL 6900 M.s. Thesis Research In Pharmacology
[1-6 credit hours]
M.S. thesis research in pharmacology.
Term Offered: Spring, Summer, Fall

PHCL 6920 M.s. Thesis Research In Pharmacology
[1-6 credit hours]
M.S. thesis research in pharmacology.
Term Offered: Spring, Summer, Fall

PHCL 7100 Experimental Therapeutics I
[3 credit hours]
The course will cover the application of basic principles of pharmacology to the development of new therapies for human disease. A primary focus will be the translation of laboratory discoveries into clinical applications.
Prerequisites: PHCL 3700 with a minimum grade of B- or PHCL 5700 (may be taken concurrently) with a minimum grade of B-
Term Offered: Fall

PHCL 7200 Experimental Therapeutics II
[3 credit hours]
The course will expand upon material covered in Experimental Therapeutics I and focus on the drug development process. Practical applications include the design of in vitro and in vivo screens for drug activity, improvement of pharmacokinetic properties and integration of medicinal chemistry with pharmacology in a drug development paradigm.
Prerequisites: PHCL 5100 with a minimum grade of B- or PHCL 7100 with a minimum grade of B-
Term Offered: Spring

PHCL 7440 Current Topics in Interpretation of Pharmaceutical Data
[1 credit hour]
The basic statistical techniques learned in PHCL 4140/5140 will be further explored using research articles and real data sets to conduct statistical analyses. The use of different software programs will be used to provide students with hands-on practice in conducting statistical analyses.
Prerequisites: PHCL 5140 (may be taken concurrently) with a minimum grade of B-
Term Offered: Summer

PHCL 7460 Current Topics in Pharmacokinetics Toxicokinetics
[1 credit hour]
An advanced discussion of the theory and practice of using kinetic principles to model the time course of drugs and toxic chemicals in the body and in the environment. The student should understand the relationship between chemical time courses and outcomes and application to risk assessment. Additionally, students will gain hands-on practice using kinetic analysis methods and software.
Prerequisites: PHCL 4760 with a minimum grade of B- or PHCL 5760 (may be taken concurrently) with a minimum grade of B-
Term Offered: Spring, Fall

PHCL 7500 From Experimental to Applied Therapeutics
[4 credit hours]
The course focuses on bridging the gap between experimental and clinical applications of drugs. It will discuss groups of structurally related drugs designed to treat certain conditions, their basic molecular pharmacological action and how that is applied clinically. The course will also include discussing toxicity of some drugs and xenobiotics manufactured for certain applications, their basic molecular actions and their clinical toxicity.
Prerequisites: PHCL 3700 with a minimum grade of B- or PHCL 5700 (may be taken concurrently) with a minimum grade of B-
Term Offered: Fall

PHCL 7770 Current Topics in Toxicology I
[1 credit hour]
The course focuses on the most recently published studies that cover advances in the field of toxicology, including risk assessment of toxic chemicals, toxicokinetics, chemically ¿induced mutations, cancer and developmental toxicity, toxic responses of various body systems to different chemicals and drugs, toxicity of pesticides and heavy metals.
Prerequisites: PHCL 4730 with a minimum grade of B- or PHCL 5730 (may be taken concurrently) with a minimum grade of B-
Term Offered: Fall

PHCL 8300 Research Experience in Experimental
[2-6 credit hours]
The course is intended for laboratory rotations to familiarize students with research topics in various clinical/basic science laboratories. A primary focus is to allow students to shadow, learn, experience and perform specific laboratory techniques.
Term Offered: Spring, Summer, Fall

PHCL 8390 Problems in Experimental Therapeutics
[1-6 credit hours]
The course will examine current topics and trends in the field of experimental therapeutics. The nature of the course will vary from student to student, depending on their background in the field, and the nature of their interest. For example, a new student may be assigned a literature search to identify papers that describe current approaches toward the treatment of human disease. A more advanced student might be given the task of researching and developing new laboratory techniques to initiate a research project. The overall goal will be to introduce students to current problems in experimental therapeutics, and help them identify an approach toward solving these problems.
Term Offered: Spring, Summer, Fall

PHCL 8650 Seminar in Experimental Therapeutics
[2 credit hours]
The course includes seminars presented by scientists from academia, industry and government who are invited by the department to speak about their research. Research subjects to be covered by the seminars are within the field of therapeutics and related areas, such as toxicology, molecular and genetic mechanisms in drug/chemical action, risk assessment, biomarkers and others.
Term Offered: Spring, Fall

PHCL 8960 Dissertation Research in Experimental Therapeutics
[1-15 credit hours]
The course entails laboratory and/or clinical research focused on the development of experimental therapeutics directed toward human disease. Students engaged in PH.D. dissertation research will identify a significant research problem and develop a strategy for addressing an area of unmet need. Together with the major advisor and dissertation committee members, the student will develop a research plan that addresses major questions in the chosen field using an hypothesis driven approach.
Term Offered: Spring, Summer, Fall