PHARMACOLOGY AND TOXICOLOGY (PHTX)

Subject-area course lists indicate courses currently active for offering at the University of Louisville. Not all courses are scheduled in any given academic term. For class offerings in a specific semester, refer to the Schedule of Classes (https://csprd.louisville.edu/psp/ps_class/EMPLOYEE/PSFT_CS/c/COMMUNITY_ACCESS.CLASS_SEARCH./x/?state=62dab551a0d600a5e8237359c50704e59007&duo_code=sjUx2OSTj21blWVEuQ3Z1YRjHmfxpqoV).

500-level courses generally are included in both the undergraduate- and graduate-level course listings; however, specific course/section offerings may vary between semesters. Students are responsible for ensuring that they enroll in courses that are applicable to their particular academic programs.

Course Fees

Some courses may carry fees beyond the standard tuition costs to cover additional support or materials. Program-, subject- and course-specific fee information can be found on the Office of the Bursar website (https://louisville.edu/bursar/tuitionfee/university-fees/).

PHTX 606. Seminar **1 Unit**
Description: The fall semester of Pharmacology seminar is designed to introduce first- and second-year graduate students to the formal organization of a scientific presentation.
Note: Graded on a Pass-Fail basis.

For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

PHTX 616. Advanced Pharmacology **1-12 Units**
Description: Work conducted outside the thesis area and with a preceptor other than the thesis director. By special arrangement.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

PHTX 617. Laboratory Rotation Research **1 Unit**
Description: The purpose of this course is to provide students in search of a laboratory in which to perform thesis/dissertation research the opportunity to become acquainted with the research of particular faculty and the techniques used in that faculty's laboratory. Students will approximately 10-15 hours per week conducting literature surveys and conducting experiments under the direction of graduate faculty mentor. They will function as a member of the laboratory for the duration of the rotation. Rotations are for one-half semester each. Students will do two rotations in a semester. Course may be retaken once.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

PHTX 618. Topics in Pharmacology & Toxicology **1-12 Units**
Prerequisite(s): Department majors only.
Description: Topics of current interest in Pharmacology and Toxicology. By special arrangement.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

PHTX 619. Research **1-12 Units**
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

PHTX 625. Scientific Writing **2 Units**
Description: This course is to give students hands-on experience with writing and critiquing scientific papers and proposals.The course will involve both didactic lectures and student presentations and workshops. Students will be graded on their class involvement, presentations, and homework assignments. No special restrictions or conditions are stipulated.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

PHTX 631. Risk Assessment **1 Unit**
Description: This one-hour course will introduce students to the historical underpinnings of risk assessment, and to methods, policies, and procedures used by risk assessors in today's governmental bodies. At the conclusion of the course, students should understand how peer-reviewed publications, especially those demonstrating close response, are used in the derivation of acceptable exposure limits. Emphasis will be placed on the estimation of acceptable exposure limits for non-carcinogenic effects of orally encountered chemicals.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

PHTX 632. Analysis of Parametric & Non-parametric Data **2 Units**
Description: An introduction to descriptive and inferential statistics including exploratory analysis, graphing, descriptive methods, estimation, confidence intervals, hypothesis testing, correlation, and regression. Students will be introduced to the theory and application of one-, two- and multi-group parametric and non-parametric methods. In addition, students will learn how to calculate the odds or risk of developing disease given an exposure using simple logistic regression analysis. Students will give an oral presentation that incorporates statistical principles learned to their individual graduate research projects.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

PHTX 633. Career Opportunities in the Biomedical Sciences **1 Unit**
Grading Basis: Pass/Fail
Description: The goal of this course is to expose biomedical trainees to a range of diverse career options so that they can make confident and informed decisions about the way that they will move their career. Students will have the opportunity to hear from and to interact with professionals that hold positions in non-academic biomedical or biomedically related career fields. Students will complete an Individual Development Plan and learn how to compose a curriculum vita and a resume.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

PHTX 634. Introduction to Medical Product Regulatory Affairs **1 Unit**
Term Typically Offered: Spring Only
Prerequisite(s): Permission of the course director.
Description: This is a graduate-level course that will familiarize students with basic concepts of regulatory compliance during drug, biologic, and medical device development. Basic concepts to be taught are: 1) Product development life-cycles, focusing on phases of development and stages for interactions with regulatory agencies; 2) Quality control and assurance in the laboratory, manufacturer, and clinic the basis of good practices; 3) Familiarization with FDA guidance documents, ICH guidelines, and the code of federal regulations. Upon completion of the course, students should have an understanding of the relationship between regulators, drug or device developers (bench scientists and clinicians), manufacturers, and patients.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

PHTX 641. Principles of Pharmacology **3 Units**
Term Typically Offered: Fall Only
Prerequisite(s): First-year Pharmacology graduate student or permission of course director.
Description: This is a graduate level course that will provide a foundation of the general principles of pharmacology upon which the students can subsequently build their knowledge in pharmacology. Major topics that will be covered include pharmacodynamics, receptor types and drug-receptor interactions, pharmacokinetics, biotransformation, and pharmacogenomics. The course will progress through the relevant portions of Katzung's Basic & Clinical Pharmacology to introduce these fundamental areas.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

PHTX 642. Principles, Applications, and Research Methods in Pharmacology **3 Units**
Term Typically Offered: Spring Only
Prerequisite(s): First-year Pharmacology graduate student or permission of course director.
Description: This is a Graduate level course providing a foundation of the general principles, applications, and research methods of pharmacology. The course will progress through Basic & Clinical Pharmacology chapters to introduce the fundamental areas of applied Pharmacology. This will be supplemented by faculty lectures on current research methods in Pharmacology. In addition, student presentations and discussion of assigned research articles will be used to reinforce the fundamental pharmacological principles, applications and research methods. Importantly, research papers and "flipped lectures" presented by students will also give them opportunities to practice presentation skills in delivering formal Pharmacology lectures/research results.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

PHTX 643. Environmental Toxicology **3 Units**
Term Typically Offered: Fall Only
Prerequisite(s): First year Pharmacology/Toxicology graduate student or permission of the course director.
Description: This is a graduate level course that will provide a foundation of the general principles of toxicology upon which the students can subsequently build their knowledge in toxicology. A major focus of this course is on basic principles, mechanisms and common methods underpinning the science of toxicology. The major emphasis is for students to develop an understanding of how chemicals cause their effect (i.e. mechanisms of toxicity) including molecular and cellular changes through the lens of environmental toxicology. Students will develop a fundamental understanding of how chemicals may exert toxic effects to cause DNA damage and disrupt DNA repair resulting in various diseases highlighting cancer.
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PHTX 644. Organ Toxicology **3 Units**
Term Typically Offered: Spring Only
Prerequisite(s): First year Pharmacology graduate student or permission of the course director.
Description: This is a graduate level course that will provide a foundation of the main concepts in organ toxicology and the methods used to study organ toxicology. Major topics that will be covered include common toxicities observed in the main body organs and standard as well as novel techniques for studying them. The course is based on Casarett and Doull's "Toxicology - the basic science of poisons" but may also include several specialist modules outside of the textbook.
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PHTX 652. Geriatric Pharmacology **1 Unit**
Prerequisite(s): PHTX 395 or equivalent.
Description: This course will be offered to senior graduate students and nursing students wishing to expand their knowledge on the pharmacokinetics, drug metabolism, toxicities, distribution and drug dosages and interaction in the elderly.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

PHTX 661. Molecular Mechanisms of Toxicology **3 Units**
Term Typically Offered: Spring Only
Description: Molecular interactions of drugs and toxicants on cellular processes; including foreign compound metabolism, signal tranduction, cell cycle, DNA repair/DNA replication are covered and put in context topics in molecular epedimiology.
Note: Crosslisted with BIOC 661.

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PHTX 667. Advanced Cell Biology **3 Units**
Term Typically Offered: Spring Only
Prerequisite(s): One quarter of graduate-level Biochemistry or consent of instructor.
Description: Advanced treatment of contemporary cell biology including membrane structure and function, cytoskeleton, signal transduction, regulation of cell cycle, apoptosis, and molecular mechanisms of cellular differentiation. Spring semester.
Note: Cross-listed with BIOC 667, ASNB 667, BIOL 667 and MBIO 667.

For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

PHTX 671. Nanomedicine 1: Nanopharmacology Fundamentals **3 Units**
Term Typically Offered: Fall Only
Prerequisite(s): Admission to the MS in Interdisciplinary Studies, concentration in Nanomedicine.
Description: The Nanomedicine I course is designed to provide nanopharmacology principles related to the biophysical characterization, biodistribution, clearance and pharmacokinetic modeling of nanopharmaceuticals. The course is focused on common FDA approved nanopharmaceuticals of clinical relevance including lipid-based, iron oxide, albumin and anti-viral nanotherapeutics that are likely to be encountered by medical science researchers and/or health care providers in patient care settings. Additional classes of nanopharmaceuticals with promising therapeutic potential are integrated throughout the curriculum. The course content emphasizes mastery of the principles required for life-long learning within the field of nanopharmacology. Student-led nanopharmaceutical manuscript presentations and problem-based learning projects integrate course information and provide practical exposure to nanomedicine at the interface of biomedical research and patient care.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

PHTX 681. Nanomedicine 2: Nanopharmaceutical Translation **3 Units**
Term Typically Offered: Spring Only
Prerequisite(s): PHTX 671.
Description: The Nanomedicine 2: Nanopharmaceutical Translation course is designed to build on the nanopharmacology principles presented in the pre-requisite Nanomedicine I course. The Nanomedicine II course is focused on the interface between immunology and nanomedicine, immunotherapeutics, extracellular vesicle-based nanomedicine, nanotoxicology, nanomedicine manufacturing and regulation. The course content emphasizes mastery of the principles required for lifelong learning related to translational nanomedicine. Student-led nanopharmaceutical manuscript presentations and problem-based learning projects integrate and translate the information provided in lectures and provide practical exposure to nanomedicine at the interface of biomedical research and patient care.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

PHTX 816. Special Project-Pharmacology **1-16 Units**
Description: This course is to be arranged to fit individual needs to cover topics of current interest, to participate in research project or to receive some advance training.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)