PHARMACY—PHARMACEUTICS

PHA 5729 Intentional Living: Developing a Wellness Mindset (AKA, The Happiness Course) 1 Credit
Grading Scheme: S/U
This course will explore the concept of happiness and examine evidence-based practices that support personal growth, meaningful relationships and contentment. Through participation in class discussion, experiential activities and independent learning, students will gain knowledge and skills promoting a wellness mindset. Students will increase self-awareness around resilience, growth mindset, and professional burnout mitigation strategies.

PHA 6116 In Vivo and In Vitro Stability of Drugs 3 Credits
Grading Scheme: Letter Grade
Effects of various disease states, age, genetic differences, stress, nutrition, and drug interactions on drug metabolism. Offered fall term in even-numbered years.

PHA 6122 Population Pharmacokinetics and Pharmacodynamics 3 Credits
Grading Scheme: Letter Grade
Offers a comprehensive exploration of theoretical concepts in population Pharmacokinetics/Pharmacodynamics modeling with practical applications using continuous and noncontinuous data. There are two assigned lectures weekly, available online. Half of the lecture series consists of live, hands-on active learning sessions with recordings posted afterward. Assignments related to active learning sessions will be provided. Students have the flexibility to watch the lectures at their convenience.
Prerequisite: PHA 6125.

PHA 6123 Quantitative Systems Pharmacology (QSP) Modeling 3 Credits
Grading Scheme: Letter Grade
Provides a comprehensive overview of Quantitative Systems Pharmacology (QSP) modeling and its applications across the drug development process. This course mimics a real world QSP project by integrating theory, practice, and the experience of working in multidisciplinary groups. Students will gain a foundational understanding of QSP principles, develop and evaluate models based on disease pathophysiology and drug mechanisms of action, and explore QSP's role in RD.
Prerequisite: PHA 6125.

PHA 6125 Introduction to Quantitative Pharmacology 3 Credits
Grading Scheme: Letter Grade
Compartmental analysis with computers. Offered spring term in even-numbered years.

PHA 6131 Physiologically-Based Modeling 3 Credits
Grading Scheme: Letter Grade
Provides students and trainees with the theoretical concepts as well as hands-on applications in physiologically-based modeling and its use in drug development and regulatory evaluation with focus on physiologically-based pharmacokinetic (PBPK) modeling.

PHA 6133 Translational Clinical Pharmacology 3 Credits
Grading Scheme: Letter Grade
Provides Pharm.D. and Ph.D. students with an in-depth understanding of experimental, basic and advanced modeling simulation methodologies and their application to optimize patient dosing and rationally develop drugs.
Prerequisite: completion of an intro course on pharmacokinetic or pharmacodynamic principles such as PHA5132 (or equivalent). Documentation of course content (incl. contact hours) should be provided. The final decision will be made by the course director.

PHA 6170C Pharmaceutical Product Formulation 3 Credits
Grading Scheme: Letter Grade
Rationale and design of pharmaceutical dosage forms. Offered fall term in odd-numbered years.

PHA 6183 Pharmaceutical Gene Delivery 3 Credits
Grading Scheme: Letter Grade
Designed for graduate students researching gene delivery. Lectures on vector design and construction including review of related molecular biology and cell biology. Lectures on gene delivery systems (both viral and nonviral vectors) and their applications. Recent progress of gene therapy for human diseases including student presentations. Offered in odd-numbered years.

PHA 6185 Life Cycle of a Drug 1 Credit
Grading Scheme: Letter Grade
This foundational course in the Pharmaceutical Sciences provides an introduction to and conceptual basis for research across the “life cycle of a drug;” from design and discovery through preclinical studies to clinical trials and post-marketing assessment of drug safety and efficacy, leading to re-design and restart of the cycle.
Prerequisite: Students should have completed their first year of the graduate program in pharmaceutical sciences or have completed the first two years of the PharmD curriculum.

PHA 6416 Pharmaceutical Analysis I 3 Credits
Grading Scheme: Letter Grade
Theory and applications of relevant analytical techniques for analysis of drugs in biological samples. Offered spring term in odd-numbered years.

PHA 6418 Model-Informed Drug Development 3 Credits
Grading Scheme: Letter Grade
Prepares students to become experts in systems-level modeling of various diseases and therapeutics. Trainees will learn the effect of drugs on major physiological-systems and how these effects can be beneficial or detrimental. Various computational tools are introduced. Problem-based-learning exercises will enable trainees to design experiments and interpret data quantitatively.
Prerequisite: The ideal prerequisite would be completion of an introductory course in basic pharmacology and or pharmacokinetics and pharmacodynamics. Equivalent courses are acceptable. Courses such as PHA5132 and PHA6125 are recommended but not required.

PHA 6449 Pharmacogenomic and Genomic Data Analysis 3 Credits
Grading Scheme: Letter Grade
Contemporary experimental approaches in pharmacogenomic and genomic research design. This course will focus on pharmacogenomics and human genomics, particularly disease genomics; including utilization of key knowledge from the central dogma of molecular biology, the human genome, genomic, transcriptomic, and metabolomics approaches, and approaches to defining functional effects of candidate biomarkers.
Prerequisite: biochemistry, PHA 6425, or consent of instructor.

PHA 6630 Foundations of Medication Management: Pharmacotherapy of Chronic Disease 3 Credits
Grading Scheme: Letter Grade
This course will introduce the core elements of comprehensive medication management (CMM), communication techniques, and documentations strategies needed for the successful provision of CMM services. Content will focus on incorporating precision medicine and pharmacogenomics into CMM care and business models.

PHA 6631 Foundations of Medication Management: Patient Care and Practice 3 Credits
Grading Scheme: Letter Grade
This course will introduce the core elements of comprehensive medication management (CMM), communication techniques, and documentations strategies needed for the successful provision of CMM services. Content will focus on incorporating precision medicine and pharmacogenomics into CMM care and business models.

PHA 6632 Foundations of Medication Therapy Management II 3 Credits
Grading Scheme: Letter Grade
Business elements of medication therapy management (MTM), MTM practice models, documentation systems, business plan development, and basic financial principles needed for the successful provision of MTM.
Prerequisite: All students have a prior pharmacy degree.

PHA 6633 Foundations of Medication Management: Individualized Pharmacotherapy I 3 Credits
Grading Scheme: Letter Grade
Prepare the student to utilize a comprehensive medication therapy management (CMM) and precision medicine approach in patients with chronic health conditions that range from common to complex focusing on select cardiovascular, respiratory, neurological, mental health, and gastrointestinal disorders.
Prerequisite: GMS 6224 and PHA 6134 and PHA 6935.

PHA 6634 Foundations of Medication Management: Individualized Pharmacotherapy II 3 Credits
Grading Scheme: Letter Grade
Prepares the student to utilize a comprehensive medication therapy management (CMM) and precision medicine approach in patients 2235 with chronic health conditions that range from common to complex focusing on select women's health, men's health, hematology, endocrine, and renal disorders.
Prerequisite: GMS 6224 and PHA 6134 and PHA 6935.

PHA 6635 Medication Therapy Management: A Renal Focus 3 Credits
Grading Scheme: Letter Grade
Principles of medication therapy management in patients with renal disorders.
Prerequisite: PHA 6631 and PHA 6632

PHA 6636 Medication Therapy Management: A Gastrointestinal Focus 3 Credits
Grading Scheme: Letter Grade
Principles of medication therapy management in patients with gastrointestinal disorders.
Prerequisite: Foundations of MTM I and Foundations of MTM II

PHA 6637 Medication Therapy Management: A Psychiatric Focus 3 Credits
Grading Scheme: Letter Grade
Introducing the student to principles of medication therapy management in patients with psychiatric disorders.
Prerequisite: The student must have successfully completed Foundations of MTM I (PHA 6631) and Foundations of MTM II (PHA 6632)

PHA 6638 Medication Therapy Management: A Neurologic Focus 3 Credits
Grading Scheme: Letter Grade
Introducing the student to principles of medication therapy management in patients with neurologic disorders.
Prerequisite: The student must have successfully completed Foundations of MTM I (PHA 6631) and Foundations of MTM II (PHA 6632)

PHA 6639 Medication Therapy Management: A Respiratory Focus 3 Credits
Grading Scheme: Letter Grade
Introducing the student to principles of medication therapy management in patients with respiratory disorders.
Prerequisite: The student must have successfully completed Foundations of MTM I (PHA 6631) and Foundations of MTM II (PHA 6632).

PHA 6740 Fundamentals of Grant Writing in the Pharmaceutical Sciences 2 Credits
Grading Scheme: Letter Grade
This course is designed to teach the fundamentals of grantsmanship, which will be applied in real-time as the student writes their proposal.
Prerequisite: Students must have completed two years of study in the Pharmaceutical Sciences graduate program. Exemptions to this must be approved by the concentration graduate coordinator.

PHA 6830 Nanomedicine-based Immunotherapy 3 Credits
Grading Scheme: Letter Grade
Covers the whole spectrum of nanomedicine drug development through the lens of immunology and immunotherapy, by integrating nanomedicine formulation with Drug Delivery, Pharmaceutical Analysis, and Pharmacokinetics. The topics covered in this course include nanomedicine formulation and characterization, pharmacology (PKPD), and their clinical translation.
Prerequisite: Permission of instructor.

PHA 6894 Introduction to Graduate Studies 1 Credit
Grading Scheme: Letter Grade
time management, intellectual property, research notebooks, laboratory leadership, grantsmanship, preparing presentations, publishing and professionalism.
Prerequisite: consent of instructor.

PHA 6910 Supervised Research 1-5 Credits, Max 5 Credits
Grading Scheme: S/U
Supervised Research

PHA 6935 Selected Topics in Pharmacy 1-4 Credits, Max 18 Credits
Grading Scheme: Letter Grade
Open to all departments in the College of Pharmacy.

PHA 6936 Advanced Topics in Pharmaceutical Sciences 1-2 Credits, Max 4 Credits
Grading Scheme: Letter Grade
Written and oral presentation of research designs, protocols, papers, and critical appraisals with discussion and critical review of such topics.

PHA 6938 Research Seminar 1 Credit, Max 3 Credits
Grading Scheme: Letter Grade
Seminar required of graduate students in the College of Pharmacy.

PHA 6940 Supervised Teaching 1-5 Credits, Max 5 Credits
Grading Scheme: S/U
Supervised Teaching

PHA 6971 Research for Master's Thesis 1-15 Credits
Grading Scheme: S/U
Research for Master's Thesis

PHA 7979 Advanced Research 1-12 Credits
Grading Scheme: S/U
Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy.

PHA 7980 Research for Doctoral Dissertation 1-15 Credits
Grading Scheme: S/U
Research for Doctoral Dissertation