TRANSLATIONAL SCIENCE AND MEDICINE COURSES

Translational Science and Medicine Courses

TSM501 Foundations in Biomedicine and Translational Science
Hours 6

This course is an overview of human health, disease, and remedies that presents an overview of drug design, preclinical testing, medicines development, manufacture and supply, biologics and advanced therapies, digital medicines, and regulatory submission.

Prerequisite(s): Admission to the program, or approval of course instructor.

TSM660 Drug Delivery Beyond the Biological Barriers
Hours 4

This course provides an overview of drug discovery, formulation, and delivery with efforts to reflect on the past and peek into the future drug development. This course requires substantial knowledge of chemistry, mathematics, and physics, and basic courses in biological sciences.

TSM661 Imaginary Logic of Advanced Drug Delivery Program
Hours 1

This course presents topics designed to bring together divergent thinking (imaginary) with convergent thinkers (logical) to provide a platform to train the next generation of students to think horizontally to overcome the valley of death in drug discovery and bring new therapies to clinic. As a career preparation course, it aims to provide students the depth and breadth of understanding in drug discovery and development that will be applicable throughout their careers, regardless of their research focus.

TSM662 Formulations Science Lab
Hours 3

This research-based laboratory course provides training in the of drug delivery systems through a broad spectrum of techniques including synthesis of polyesters and their bioconjugation, characterization of polyesters using the state-of-the-art analytical tools, processing the polyesters into nanoparticulate drug carrier systems encapsulating diverse model drugs, and characterization of the nanoparticles for size, loading, encapsulation, release, and stability. This course will provide basic training and experience for a smooth start for future laboratory work. This course requires substantial knowledge of chemistry, mathematics, and physics, and basic courses in biological sciences.

Prerequisite(s) with concurrency: TSM 660

TSM663 Formulations Testing Lab
Hours 3

This research-based laboratory course that focuses on training students in testing the next generation of drug delivery systems. Students will be exposed to a broad spectrum of techniques (e.g., in vitro, ex vivo, in vivo). Students will be exposed to a variety of techniques including tissue processing for tissue mechanics, drugestimation, particle tracking, receptor binding, and histology and immunohistochemical analysis, and in vitro and ex vivo study designs. Students will have hands-on experience in a wide variety of microscopy and histology equipment. This course will provide basic training and experience for a smooth start for future laboratory work involving pharmacology testing. This course requires substantial knowledge of chemistry, mathematics, and physics, and basic courses in biological sciences.

Prerequisite(s): TSM 662

TSM664 Drug Delivery Bioanalysis Lab I
Hours 3

This course provides individual training on the use of different equipment in the bioanalytical core in support of graduate student research in advanced drug delivery. This lab-based course trains students to develop and adapt bioanalytical methods that are pivotal for in vitro, ex vivo and in vivo testing of experimental therapeutics.

TSM665 Drug Delivery Bioanalysis Lab II
Hours 3

This course is designed to offer individualized training to students in advanced drug delivery, focusing on the use of various equipment in the bioanalytical core. Through this lab-based course, students will learn how to develop and adapt bioanalytical methods crucial for in vitro, ex vivo, and in vivo testing of experimental therapeutics.