

PHARMACY—PHARMACY PRACTICE

GMS 6951 Teaching Biomedical Science 2 Credits

Grading Scheme: Letter Grade

Acquire the skills necessary for creating and modifying courses through a combination of self-awareness activities and information drawn from the field of curriculum that informs teaching across content areas.

Learning skills to write a teaching philosophy, draft components of their own course syllabus, add these components to their portfolio. Learning platform-online;Canvas

GMS 6952 Curricular Models for Biomedical Science 3 Credits

Grading Scheme: Letter Grade

Students are introduced to various models of teaching and instructional strategies. Models of teaching give instructors the tools they need to build strong learning environments and interactions that accelerate learning. Models provide a blueprint, structure, direction for teaching. Students will learn to develop curriculum, analyze structure and identify the teaching models.

GMS 6953 Art and Science of Mentoring 1 Credit

Grading Scheme: Letter Grade

Learn to mentor other professionals who are in early stages of career development. Develop knowledge and skills through provision of didactic information and experiential learning activities. Complete an individual development plan, identify ethical dilemmas in mentoring and describe strategies to prevent them, and articulate their own mentoring philosophy.

GMS 6954 Assessing Effectiveness of Biomedical Science Teaching and Curricula 3 Credits

Grading Scheme: Letter Grade

Overview of the models of evaluation within contrasting paradigms as it relates to biomedical science education. Topics address concerns while adhering to the professional, scholarly and ethical roles the evaluator must uphold. Develop rubrics, select assessments, use peer observations for assessment of teaching methods, products and outcomes in clinics/laboratories, learning environments.

PHA 6051 Principles of Community Engagement Research for Health Equity 2 Credits

Grading Scheme: Letter Grade

An introduction to Community engagement research (CEnR) to address health disparities. Students will explore the concept of community engagement to identify appropriate partners for, and conducting CEnR through self-learning, active learning, and real life experiences in developing a research objective, study design, recruitment, instrument design, data collection, analysis, and dissemination.

PHA 6120 Foundations in Precision Medicine: Pharmacogenomics 3 Credits

Grading Scheme: Letter Grade

Covers the foundational concepts underpinning pharmacogenomics research and implementation. Topics include the pharmacogenomics of drug metabolizing enzymes, drug transporters, adverse drug reactions, and drug interactions. Students will gain familiarity with pharmacogenomics database tools and learn about real-world examples of pharmacogenomic test implementation.

PHA 6134 Foundations in Precision Medicine: Genomic Technologies 1 Credit

Grading Scheme: Letter Grade

Focuses on current developments and emerging trends in genomic testing, clinical and research applications of emerging genomic tests, role of computing and data science, and applications of bioinformatics in genomics.

Prerequisite: Students must have basic knowledge of genetics and molecular biology.

PHA 6135 Clinical Applications of Precision Medicine: Pharmacogenomics 2 Credits

Grading Scheme: Letter Grade

Focuses on how pharmacogenomic and genomic data can be used in patient care. Students can opt to participate in personal genotyping and use their own genetic data for class assignments or work with a de-identified genotype dataset.

Prerequisite: GMS 5224 - Foundations in Precision Medicine: Medical Molecular Genetics & PHA 6134 - Foundations in Precision Medicine: Genomic Technologies & PHC 6598 - Foundations in Precision Medicine: Genetic Epidemiology.

PHA 6136 Clinical Applications of Precision Medicine: Oncology 3 Credits

Grading Scheme: Letter Grade

This course will provide an overview of the relevant genomic and somatic mutations within each main oncology tumor subtype and explore ways to use genomic and somatic mutation information to improve clinical and therapeutic decision making.

Prerequisite: GMS 5224 - Foundations in Precision Medicine: Medical Molecular Genetics & PHA 6134 - Foundations in Precision Medicine: Genomic Technologies & PHC 6598 - Foundations in Precision Medicine: Genetic Epidemiology.

PHA 6137 Clinical Pharmacogenomics Implementations 2 Credits

Grading Scheme: Letter Grade

Explore ways to implement use of pharmacogenetic tests in patient care. The course will address barriers to clinical implementation of pharmacogenetic tests by referencing appropriate guidelines and evidence-based and peer-review recourses.

Prerequisite: PHA 6134 & GMS 6224 & PHC 6598

PHA 6138 Foundations in Precision Medicine: Genetic Epidemiology 1 Credit

Grading Scheme: Letter Grade

Provides an exposure to fundamental concepts, terminologies and principles in human population genetics and applied molecular biology relevant to design, conduct and interpretation of genetic epidemiologic studies.

Prerequisite: GMS 6224 and PHA 6134.

PHA 6140 Quality Control and Assurance in the Pharmaceutical Industry 3 Credits

Grading Scheme: Letter Grade

The two most important elements of quality assurance in the pharmaceutical industry are good laboratory practices (GLP) and good manufacturing practices (GMP) since they directly address the quality of the drug product. The basis for the understanding of GLP and GMP in the pharmaceutical and related industries will be covered as well as an overview of the accreditation process for several regulatory agencies including the US Food Drug Administration (FDA) and the European Medicines Agency (EMA).

PHA 6184 Pharmaceutical Research & Development: Foundations and Impact on Individualized Medicine 3 Credits**Grading Scheme:** Letter Grade

This elective course provides a through introduction to the way modern pharmaceuticals (drugs) are discovered, developed, regulated, and marketed. It is intended to give the student an overview of how the pharmaceutical industry operates and the various functional roles of the people involved.

PHA 6232 Forensic Ethics 2 Credits**Grading Scheme:** Letter Grade

Provide a background on the unique ethical considerations that forensic scientists face; students will explore what the guiding principles are for ethics in forensic science, the culture of the criminal justice system, and how to consider ethics both scientifically and in the courtroom.

PHA 6241 Introduction to Artificial Intelligence in Pharmacy 3 Credits**Grading Scheme:** Letter Grade

Provide an introductory background in the applications of artificial intelligence (AI) and machine learning (ML) techniques that are commonly used in pharmacy practice covering all phases from drug discovery to the post-approval assessment of drug safety, effectiveness and value in real-world settings.

Prerequisite: GMS 6224 and PHA 6134 and PHC 6598.**PHA 6247 Principles of Pharmacy Informatics 3 Credits****Grading Scheme:** Letter Grade

Introduces the theory and concepts of pharmacy informatics and health informatics. Develop the knowledge to discuss the nature of health informatics as an important discipline; and recognize different methods used to analyze fundamentals of workflow process analysis, system redesign, usability, and human factors.

Prerequisite: GMS 6224 and PHA 6935 and PHC 6598.**PHA 6427 Pharmacogenetics of Drug Metabolism 2 Credits****Grading Scheme:** Letter Grade

Examination of factors that affect drug disposition and response including genetics, as well as, additional factors such as environment, diet, age, and concurrent drug therapy and health status. Students will acquire an understanding of pharmacogenetics/pharmacogenomics in the context of variability in drug disposition and the application of pharmacogenetics to drug development and drug treatment.

PHA 6443 Case Studies in Clinical Pharmacogenomics 3 Credits**Grading Scheme:** Letter Grade

Provides an overview of the use of pharmacogenomic data to inform clinical and therapeutic decision making for gene-drug pairs across a range of conditions.

Prerequisite: PHA 6134 and GMS 6224 and PHA 6935.**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 6539 Evidence-Based Applications in Clinical Toxicology 3 Credits****Grading Scheme:** Letter Grade

Introduces students to the evidence-based best practice applications associated with the discipline of clinical toxicology. Learners will be exposed to clinical applications through case studies and evidence-based approaches to the diagnosis and management of the poisoned patient. This course focuses on the development of critical thinking and literature evaluation skills in the field of clinical toxicology.

Prerequisite: PHA 6557 with a minimum grade of C.**PHA 6613 Clinical Applications Precision Medicine: Precision Health 3 Credits****Grading Scheme:** Letter Grade

Clinical Applications Precision Medicine: Precision Health

Prerequisite: GMS 5224 - Foundations in Precision Medicine: Medical Molecular Genetics & PHA 6134 - Foundations in Precision Medicine: Genomic Technologies & PHC 6598 - Foundations in Precision Medicine: Genetic Epidemiology.

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 6725 Ethics in Genetics 3 Credits****Grading Scheme:** Letter Grade

Engagement, critical discussion, and reflection on relevant topics pertaining to ethics, law, and social policy of issues posed by the development of genetic technology in scientific research, clinical practice, and social impact.

Prerequisite: GMS 6224, PHA 6935, AND PHC 6598.**PHA 6746 Patient Education and Communication in the Era of Precision Medicine 1 Credit****Grading Scheme:** Letter Grade

Focuses on emerging issues in patient education and communication in precision medicine.

Prerequisite: GMS 5224 - Foundations in Precision Medicine: Medical Molecular Genetics & PHA 6134 - Foundations in Precision Medicine: Genomic Technologies & PHC 6598 - Foundations in Precision Medicine: Genetic Epidemiology.**PHA 6821 Risk Management & Assessment in Clinical Trials 3 Credits****Grading Scheme:** Letter Grade

Designed for professionals working in clinical trial research, either directly with patients, in the monitoring of clinical trials at every stage, its conception, conduct, and analysis. The course provides students with the knowledge to monitor the design and implementation of a clinical trial, assess patients throughout the clinical trial, and document adverse signs and symptoms.

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 12 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 6946 Practicum in the Pharmaceutical Sciences 2 Credits, Max 6 Credits**Grading Scheme:** Letter Grade

The course will provide real-world experience, in which the skills and knowledge gained in the classroom are applied in an academic, industrial, or government regulatory setting. Each practicum setting will differ based on the students' concentration and intended career field.

Prerequisite: Students must have completed the first year graduate courses required by their concentration and have a cumulative GPA of 3.0 or higher. Exemptions to this must be approved by the concentration graduate coordinator.PHA6946**PHA 6950 Precision Medicine Conference 1 Credit****Grading Scheme:** Letter Grade

Attendance or viewing of proceedings at this conference develops knowledge related to the latest strategies and technologies for bringing genomic medicine and pharmacogenomics into a clinic. Provides opportunity to learn from clinicians, researchers and thought leaders from medicine and pharmacy on implementing genomic medicine and pharmacogenomics in clinic settings.

Prerequisite: GMS 5224 - Foundations in Precision Medicine: Medical Molecular Genetics & PHA 6134 - Foundations in Precision Medicine: Genomic Technologies & PHC 6598 - Foundations in Precision Medicine: Genetic Epidemiology.**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