

# Pharmacy Practice (PHMD)

## **PHMD 1000. College: An Introduction. (1 Hour)**

Introduces the University, college, and health professions to enhance students' understanding of self and the decisions they make academically and socially as members of the University's diverse, multicultural community. Offers students an opportunity to engage in group activities and individual assignments along with active participation in a learning community to help them adjust to life on an urban campus, develop a better understanding of the learning process, acquire essential academic skills, and make connections with the faculty and students in the college.

## **PHMD 1001. Introduction to the Profession of Pharmacy. (1 Hour)**

Introduces the profession of pharmacy. Addresses professionalism, pharmacists' responsibilities, and the education and training of pharmacists.

## **PHMD 1100. Exploring Pharmacy As a Career. (2 Hours)**

Introduces the profession of pharmacy through the completion of readings and activities that allows facilitators to guide in-class discussions to provide a broad overview of the pharmacist's responsibilities. Explores the education and training of a pharmacist, the roles and responsibilities of learners within a professional degree program, and the requirements to become a pharmacy certified technician. Addresses possible pharmacist career pathways, and assists all learners becoming healthcare professionals (premed, pre-PA, nursing, etc.) with their interactions with the profession.

## **PHMD 1201. Introduction to Pharmacy Practice. (2.5 Hours)**

Seeks to prepare pharmacy students for their first introductory pharmacy practice experience (IPPE)/co-op. Introduces students to the policies, procedures, and expectations of the Cooperative Education Program. Offers students an opportunity to develop the skills needed to be successful in the preparation, activity, and reflection components of the pharmacy co-op program; to prepare their first résumés; and to learn proper interviewing techniques. Exposes students to the various co-op opportunities available to them as well as potential career paths within the pharmacy profession. Covers workplace issues including diversity, sexual harassment, ethics, and confidence of information. Introduces students to the technical knowledge and skills required for their first pharmacy experiences in both community and institutional pharmacy practice and to drug information resources. Offers students an opportunity to develop basic communication skills to aid them in successful completion of their first IPPE.

**Corequisite(s):** PHMD 1202

## **PHMD 1202. Lab for PHMD 1201. (0.5 Hours)**

Offers students an opportunity to learn several skills needed for future patient-care experiences. Supplements lecture content and provides practical reinforcement of concepts. Students apply knowledge learned in the classroom related to the appropriate and effective use of communication strategies and basic sterile techniques/manipulations. Labs related to the learning of communication skills support a patient-centered approach in assessing, adapting, and evaluating patient medication use needs.

**Corequisite(s):** PHMD 1201

## **PHMD 1990. Elective. (1-4 Hours)**

Offers elective credit for courses taken at other academic institutions. May be repeated without limit.

## **PHMD 2310. Professional Communication in Pharmacy Practice. (2 Hours)**

Offers pharmacy students an opportunity to learn the principles for understanding, applying, evaluating, and creating successful verbal and nonverbal communication interactions in a variety of pharmacist and interprofessional settings. Through a patient-centered approach, reviews and builds on core communication skills learned in the foundational introduction to pharmacy practice courses. Topics include using effective communication approaches to detect and intervene to improve adherence, facilitate behavioral change, collaborate with other professionals, and tailor communication to special and culturally diverse patient populations.

**Corequisite(s):** PHMD 2311

**Attribute(s):** NUpath Difference/Diversity

**PHMD 2311. Lab for PHMD 2310. (0.5 Hours)**

Supplements lecture content from PHMD 2310. Designed to provide pharmacy students with several skills needed for future patient-care experiences and provide practical reinforcement of concepts. Students apply knowledge learned in the classroom related to the appropriate and effective use of communication strategies. Labs related to the learning of communication skills support a client-centered approach in assessing, adapting, and evaluating patient medication use needs. Specifically offers students an opportunity to learn and practice six core communication skills: listening, asking questions, providing empathy, understanding and managing confusion, understanding and managing conflict, and understanding and analyzing nonverbal behavior.

**Corequisite(s):** PHMD 2310

**PHMD 2350. Healthcare Systems. (3 Hours)**

Examines the evolution of the American healthcare delivery system from the early forms of organized institutional healthcare through the dynamic, and increasingly integrated, delivery systems of the present. Explores the interactions of regulatory, economic, political, and social aspects of the healthcare system with particular emphasis on pharmacy practices. Compares current policies and proposals for health reform and pharmacy benefit coverage. Analyzes the impact and consequences of national and international actions in one era on the structure, function, and outcomes of healthcare and professional pharmacy practice in later years. Major emphases include factors affecting American population health, health disparities, and strategies, including pharmacy/pharmacists, to improve the nation's health.

**PHMD 2900. Global Self-Care Approaches and Strategies. (4 Hours)**

Develops a basic understanding of self-care and preventive health strategies that consumers use in United States and other cultures/countries. Examines the similarities and differences of the role of over-the-counter (OTC) medications and pharmacy in the healthcare environment through the use of the internet and contemporary media, observations in other countries, and discussions with guest speakers. Explores the clinical use, safety and efficacy of common OTC medications and complementary alternatives (vitamins, minerals, supplements, herbals, homeopathic remedies, etc.) available in the US compared to what is available in other countries. Explores historical and modern community pharmacy environments and other culturally relevant venues in other cultures.

**Attribute(s):** NUpath Integration Experience

**PHMD 2990. Elective. (1-4 Hours)**

Offers elective credit for courses taken at other academic institutions. May be repeated without limit.

**PHMD 2991. Research in Pharmacy Practice. (1-4 Hours)**

Offers an opportunity to conduct introductory-level research or creative endeavors under faculty supervision. May be repeated once.

**PHMD 3450. Research Methodology and Biostatistics. (3 Hours)**

Offers an interactive course covering aspects of research designs used in experimental and observational studies, hypothesis testing, and an introduction to basic biostatistics. Offers students an opportunity to critically examine selected articles from the clinical literature, to analyze the framing of the research question and the methods used to insure the validity and generalizability of the study's findings, and to assess for potential ethical issues in research design and conduct. Clinical trials, observational studies, and problem sets illustrate principles of research design, conduct, and data analysis.

**Prerequisite(s):** (ENGL 1102 with a minimum grade of C or ENGL 1111 with a minimum grade of C or ENGW 1102 with a minimum grade of C or ENGW 1111 with a minimum grade of C or ENGW 1113 with a minimum grade of C or ENGW 1114 with a minimum grade of C ) or graduate program admission

**Attribute(s):** NUpath Ethical Reasoning, NUpath Natural/Designed World

**PHMD 3990. Elective. (1-4 Hours)**

Offers elective credit for courses taken at other academic institutions. May be repeated without limit.

**PHMD 4350. Exploring Academic Careers. (2 Hours)**

Designed to prepare students to become more confident and effective as educators for many audiences, including peers, colleagues, clients, and patients. Offers students an opportunity to increase their awareness of teaching and learning principles and related roles and responsibilities as they apply to academic careers and faculty in the classroom, in experiential settings, and in university units. Discusses and explores knowledge, skills, and attitudes that are applicable across professions.

**PHMD 4585. Research Methods in Health Systems. (2 Hours)**

Exposes students to research skills and methods used by health system pharmacists when planning and conducting research. Builds on content from prior courses. Designed for students planning to pursue a career in a health system or the pharmaceutical industry. Focuses on discussion and application; taught by healthcare-system-based pharmacists actively involved in clinical research. Emphasizes the process used to generate robust research questions and research plans throughout. Uses practice statements/guidelines, published studies, patient databases, and faculty's current research projects to illustrate course topics.

**PHMD 4611. Comprehensive Disease Management 1. (6 Hours)**

Covers foundational concepts of pharmacy practice, including patient evaluation; identification of drug-related problems; pathophysiology; and clinical management of diseases of the respiratory, cardiovascular, and endocrine systems. Specifically covers asthma and COPD, hypertension, hyperlipidemia, diabetes, fluids/electrolytes, and renal disorders. Reviews, system-by-system, the mechanisms of these diseases and their evidence-based prevention and treatment strategies. Offers students an opportunity to apply scientific knowledge and principles of medicinal chemistry, pharmacology, pharmaceuticals, and pharmacokinetics to the design of rational, evidence-based therapeutic strategies to provide care to patients in inpatient, ambulatory, and community settings. Emphasizes pathophysiology, self-care, patient education, assessment, medication administration, management, monitoring, and preventative health and population-based health outcomes.

**Prerequisite(s):** PHSC 4502 with a minimum grade of D- ; PHSC 3412 with a minimum grade of D- ; PHMD 2350 with a minimum grade of D-

**Corequisite(s):** PHMD 4612

**PHMD 4612. Comprehensive Disease Management 1 Seminar. (1 Hour)**

Designed to provide students with opportunities to apply concepts from PHMD 4611 to patient cases, special projects, and other medication-related issues focusing on foundational aspects of pharmacy practice, identification of drug-related problems, and diseases of the respiratory, endocrine, cardiovascular, and renal systems. Accompanies PHMD 4611 and seeks to facilitate accomplishment of course objectives using an active learning format. While completing seminar work, students are expected to review, discuss, integrate, and apply information presented in comprehensive disease management lectures and readings as well as previous and concurrent course work.

**Corequisite(s):** PHMD 4611

**PHMD 4621. Comprehensive Disease Management 2. (6 Hours)**

Covers the pathophysiology and clinical management of diseases of the renal, cardiovascular, neurological, and gastrointestinal systems. Reinforces foundational concepts of pharmacy practice and diseases covered in PHMD 4611, while completing a system-by-system review of the mechanisms of renal, cardiovascular, neurological, and gastrointestinal disorders and their evidence-based prevention and treatment strategies. Offers students an opportunity to design rational therapeutic strategies to provide care to patients with these disease states in inpatient, ambulatory, and community settings. Emphasizes pathophysiology, self-care, patient education, assessment, medication administration, management, monitoring, and preventative health and population-based health outcomes.

**Prerequisite(s):** PHSC 3430 with a minimum grade of D- ; PHMD 4611 with a minimum grade of D-

**Corequisite(s):** PHMD 4622, PHMD 4623

**PHMD 4622. Comprehensive Disease Management 2 Seminar. (1 Hour)**

Designed to provide students with opportunities to apply concepts from PHMD 4621 to patient cases, special projects, and other medication-related issues focusing on foundational aspects of pharmacy practice; identification of drug-related problems; and diseases of the renal, cardiovascular, neurological, and gastrointestinal systems. Accompanies PHMD 4621 and seeks to facilitate accomplishment of course objectives using an active-learning format. While completing seminar work, students are expected to review, discuss, integrate, and apply information presented in comprehensive disease management lectures and readings as well as previous and concurrent course work. Activities in seminar are reinforced by laboratory skill-building exercises in PHMD 4623.

**Corequisite(s):** PHMD 4621, PHMD 4623

**PHMD 4623. Comprehensive Disease Management 2 Skills Lab. (0.5 Hours)**

Offers a self-paced, blended learning experience designed to provide the student with functional knowledge and skills in the area of physical assessment, patient education, and counseling in the ambulatory clinic and community pharmacy settings. Uses discussions, videos, podcasts, simulations, and hands-on learning activities in the lab. Offers students an opportunity to apply information gained in previous and concurrent courses to clinical situations. While completing laboratory work, students are expected to review, discuss, integrate, and apply information presented in the closely aligned PHMD 4621 and PHMD 4622 as well as previous and concurrent course work.

**Corequisite(s):** PHMD 4621, PHMD 4622

**PHMD 4631. Comprehensive Disease Management 3. (6 Hours)**

Covers the pathophysiology and clinical management of infectious diseases, solid organ transplant, dermatology, and otic/ophthalmic disorders. Reinforces foundational concepts of pharmacy practice and diseases covered in PHMD 4611 and PHMD 4612, while completing a system-by-system review of the mechanisms of infectious diseases and their evidence-based prevention and treatment strategies. Offers students an opportunity to design rational therapeutic strategies to provide care to patients with these disease states in inpatient, ambulatory, and community settings. Emphasizes pathophysiology, self-care, patient education, assessment, medication administration, management, monitoring, and preventative health and population-based health outcomes.

**Prerequisite(s):** PHMD 4621 with a minimum grade of D-

**Corequisite(s):** PHMD 4632, PHMD 4633

**PHMD 4632. Comprehensive Disease Management 3 Seminar. (1 Hour)**

Designed to provide students with opportunities to apply concepts from PHMD 4631 to patient cases, special projects, and other medication-related issues focusing on foundational aspects of pharmacy practice, identification of drug-related problems, and management of the infectious diseases and dermatologic and oral/otic disorders. Accompanies PHMD 4631 and seeks to facilitate accomplishment of course objectives using an active-learning format. While completing seminar work, students are expected to review, discuss, integrate, and apply information presented in comprehensive disease management lectures and readings as well as previous and concurrent course work. Activities in seminar are reinforced by laboratory skill-building exercises in PHMD 4633.

**Corequisite(s):** PHMD 4631, PHMD 4633

**PHMD 4633. Comprehensive Disease Management 3 Skills Lab. (0.5 Hours)**

Teaches and assesses various skills, including interpretation, processing, and verification of medication orders; detection and resolution of drug-related problems; use of current pharmacy software programs; and patient education and counseling in the community pharmacy setting. Uses discussions, videos, podcasts, simulations, and hands-on learning activities in the lab. While completing laboratory work, students are expected to review, discuss, integrate, and apply information presented in the closely aligned PHMD 4631 and PHMD 4632 as well as previous and concurrent course work.

**Corequisite(s):** PHMD 4631, PHMD 4632

**PHMD 4641. Comprehensive Disease Management 4. (6 Hours)**

Covers the pathophysiology and clinical management of men's and women's health issues and neurological, psychiatric, and oncologic disorders. Reinforces foundational concepts of pharmacy practice and diseases covered in PHMD 4611, PHMD 4612, and PHMD 4613, while completing a system-by-system review of the mechanisms of infectious diseases and their evidence-based prevention and treatment strategies. Offers students an opportunity to design rational therapeutic strategies to provide care to patients with these disease states in inpatient, ambulatory, and community settings. Emphasizes pathophysiology, self-care, patient education, assessment, medication administration, management, monitoring, and preventative health and population-based health outcomes.

**Prerequisite(s):** PHMD 4631 with a minimum grade of D-

**Corequisite(s):** PHMD 4642, PHMD 4643

**PHMD 4642. Comprehensive Disease Management 4 Seminar. (1 Hour)**

Designed to provide students with opportunities to apply concepts from PHMD 4641 to patient cases, special projects, and other medication-related issues focusing on foundational aspects of pharmacy practice, identification of drug-related problems, and management of women's and men's disease, psychological disorders, and cancers. Accompanies PHMD 4641 and seeks to facilitate accomplishment of course objectives using an active-learning format. While completing seminar work, students are expected to review, discuss, integrate, and apply information presented in comprehensive disease management lectures and readings as well as previous and concurrent course work. Activities in seminar are reinforced by laboratory skill-building exercises in PHMD 4643.

**Corequisite(s):** PHMD 4641, PHMD 4643

**PHMD 4643. Comprehensive Disease Management 4 Skills Lab. (0.5 Hours)**

Teaches and assesses various skills, including interpretation, processing, and verification of medication orders; detection and resolution of drug-related problems; use of current pharmacy software programs; medication reconciliation; presentation of hospitalized patients; and management of sterile compounding systems in the hospital pharmacy setting. Uses discussions, videos, podcasts, simulations, and hands-on learning activities in the lab. While completing laboratory work, students are expected to review, discuss, integrate, and apply information presented in the closely aligned PHMD 4641 and PHMD 4642 as well as previous and concurrent course work.

**Corequisite(s):** PHMD 4641, PHMD 4642

**PHMD 4700. Principles in General Medicine. (2 Hours)**

Offers students an opportunity to apply concepts learned in comprehensive-disease-management modules to patient cases, special projects, and other medication-related problems in an active-learning environment. Creates an environment similar to that of acute care advanced pharmacy practice experiences (APPEs) to enable students to gain familiarity and confidence in disease-state management, oral communication skills, and professional behavior and interactions. Focuses on oral presentations and communication skills, which is similar to how students are evaluated on clinically based rotations; students are also evaluated by quizzes and exams to measure mastery of content-specific objectives.

**PHMD 4890. Contemporary Issues in Geriatric Pharmacy. (2 Hours)**

Focuses on the physiological and practical aspects of medication use in the elderly; healthcare delivery systems; the role of healthcare professionals in providing geriatric care; and the management of geriatric syndromes. Caring for the aging population requires a patient-centered approach that encompasses the patient's health goals, a complex psychosocial landscape, as well as the physiologic changes associated with aging. It is imperative for healthcare professionals to understand the interplay of these factors in order to appropriately assess, treat, and improve outcomes for the older adult population. Offers students an opportunity to utilize problem-based learning (PBL), where students work in groups to analyze patient cases, identify problems, and develop action plans to resolve problems.

**PHMD 4970. Junior/Senior Honors Project 1. (4 Hours)**

Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Combined with Junior/Senior Project 2 or college-defined equivalent for 8-credit honors project. May be repeated without limit.

**PHMD 4971. Junior/Senior Honors Project 2. (4 Hours)**

Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. May be repeated without limit.

**Prerequisite(s):** PHMD 4970 with a minimum grade of D-

**PHMD 4990. Elective. (1-4 Hours)**

Offers elective credit for courses taken at other academic institutions. May be repeated without limit.

**PHMD 5115. Integrated Science and Therapeutics 2. (4 Hours)**

Integrates foundational concepts of pharmacology, medicinal chemistry, pathophysiology, and pharmacotherapeutics to treat patients with acute and chronic cardiovascular, renal, and gastrointestinal diseases. Studies knowledge, skills, and attitudes pertaining to drug action, drug-receptor interactions, structure-activity relationships, dose-response relationships, drug mechanisms of action, therapeutic uses, and adverse effects. Offers students an opportunity to develop patient evaluation skills using the Pharmacists' Patient Care Process and identification of drug therapy problems. Emphasizes self-care, patient education, assessment, medication administration, management and monitoring, and preventative health and population-based health outcomes. #.

**Prerequisite(s):** (PHSC 5110 with a minimum grade of D- ; PHSC 5181 with a minimum grade of D- ; PHMD 5191 with a minimum grade of D- ) or graduate program admission

**PHMD 5120. Principles of Pharmacy Practice. (4 Hours)**

Introduces policies, procedures, and expectations of the experiential program. Offers students an opportunity to prepare for their first introductory pharmacy practice experience by developing knowledge, attitudes, and communications skills needed to be successful in all components of the experiential program. Exposes students to various IPPE/co-op opportunities, as well as potential career paths, within pharmacy. Covers workplace issues including diversity, sexual harassment, ethics, and confidence of information; resumé preparation; and interviewing techniques. Introduces technical knowledge and skills required for IPPE/co-op in community and institutional settings and drug information resources.

**PHMD 5140. Integrated Social and Administrative Sciences 1. (4 Hours)**

Explores foundational concepts in social and administrative sciences, examining the organization and function of American healthcare systems. Assesses the impacts of system-level actions on individual patients. Offers students an opportunity to build skills in understanding specific drug information needs and finding and conveying this information. Compares and contrasts approaches for successful verbal and nonverbal communication among pharmacists, patients, and other health professionals across diverse situations. Evaluates American legal frameworks that establish standards for pharmacy practice today.

**PHMD 5182. Integrated Learning Lab 2. (1 Hour)**

Offers students an opportunity to develop and assimilate knowledge, skills, and attitudes related to the pharmaceutical care of patients to supplement and augment pharmacy curricular topics within an immersive learning experience. Includes pharmacology, medicinal chemistry, pathophysiology, and therapeutics of cardiovascular diseases. Uses innovative digital tools, environments, equipment, learning materials, and pedagogical methods that promote the development and refinement of problem-solving skills, adaptability/resilience, and a team mindset that can be applied during experiential activities (co-op/introductory pharmacy practice experience/advanced pharmacy practice experience), as well as future careers.

**PHMD 5191. Concepts in Practice 1. (1 Hour)**

Applies concepts through activities designed to develop knowledge, skills, and attitudes focused on foundational aspects of pharmacy practice. Covers identification of drug-related problems, problem solving, and disease state management. Focuses on patient assessment and common cardiovascular diseases. Reviews, discusses, synthesizes, and applies information from current and previous coursework and experiential activities in an active-learning format.

**PHMD 5192. Concepts in Practice 2. (1 Hour)**

Applies concepts through activities designed to develop knowledge, skills, and attitudes focused on foundational aspects of pharmacy practice. Covers identification of drug-related problems, problem solving, and disease state management. Focuses on advanced cardiovascular diseases such as myocardial infarction, arrhythmias, and renal and gastrointestinal diseases. Reviews, discusses, synthesizes, and applies information from current and previous coursework and experiential activities in an active-learning format.

**PHMD 5210. Integrated Science and Therapeutics 4. (4 Hours)**

Integrates foundational concepts of pharmacology, medicinal chemistry, pathophysiology, immunology, microbiology, and pharmacotherapeutics to treat patients with acute and chronic bacterial and fungal infectious diseases. Offers students an opportunity to develop knowledge, skills, and attitudes pertaining to drug action, drug-receptor interactions, structure-activity relationships, dose-response relationships, drug mechanisms of action, therapeutic uses, and adverse effects. Focuses on developing patient evaluation skills using the Pharmacists' Patient Care Process and identification of drug therapy problems. Emphasizes self-care, patient education, assessment, medication administration, management, and monitoring, as well as preventative health and population-based health outcomes.##

**Prerequisite(s):** (PHSC 5205 with a minimum grade of D- ; PHMD 5283 with a minimum grade of D- ; PHMD 5293 with a minimum grade of D- ) or graduate program admission

**PHMD 5215. Integrated Science and Therapeutics 5. (4 Hours)**

Integrates foundational concepts of pharmacology, medicinal chemistry, pathophysiology, immunology, and pharmacotherapeutics to treat patients with viral infectious diseases, organ transplant, and self-care therapeutics. Offers students an opportunity to develop knowledge, skills, and attitudes pertaining to drug action, drug-receptor interactions, structure-activity relationships, dose-response relationships, drug mechanisms of action, therapeutic uses, and adverse effects. Focuses on developing patient evaluation skills using the Pharmacists' Patient Care Process and identification of drug therapy problems. Emphasizes self-care, patient education, assessment, medication administration, management, and monitoring, as well as preventative health and population-based health outcomes.###

**Prerequisite(s):** (PHSC 5205 with a minimum grade of D- ; PHMD 5283 with a minimum grade of D- ; PHMD 5293 with a minimum grade of D- ) or graduate program admission

**PHMD 5220. Integrated Science and Therapeutics 6. (4 Hours)**

Integrates foundational concepts of pharmacology, medicinal chemistry, pathophysiology, and pharmacotherapeutics to treat patients with acute and chronic pain and neurologic and psychiatric diseases. Offers students an opportunity to develop knowledge, skills, and attitudes pertaining to drug action, drug-receptor interactions, structure-activity relationships, dose-response relationships, drug mechanisms of action, therapeutic uses, and adverse effects. Focuses on developing patient evaluation skills using the Pharmacists' Patient Care Process and identification of drug therapy problems. Emphasizes self-care, patient education, assessment, medication administration, management, and monitoring, as well as preventative health and population-based health outcomes.##.

**Prerequisite(s):** (PHMD 5210 with a minimum grade of D- ; PHMD 5215 with a minimum grade of D- ; PHMD 5284 with a minimum grade of D- ; PHMD 5294 with a minimum grade of D- ) or graduate program admission

**PHMD 5223. Evidence-Based Medicine. (2 Hours)**

Studies the principles of evidence-based medicine and how to apply them to patient-centered care. Offers students an opportunity to develop skills in critical appraisal of the scientific literature and practical application of the evidence to clinical decision making. Consists of didactic instruction, in-class group projects, and a group-based written assignment. Applies principles of research methodology, biostatistics, and professional writing.

**Prerequisite(s):** (ENGW 3306 with a minimum grade of C or graduate program admission)

**Attribute(s):** NUpath Writing Intensive



**PHMD 5225. Medical Writing. (2 Hours)**

Introduces concepts and principles of effective scientific writing and communication of clinical information to health professionals and the scientific community. Examines a variety of scientific genres that provide context to common writing techniques and conventions employed. Emphasizes developing expertise in critical research, data evaluation and synthesis, audience analysis, peer review, revision, and evidence-based summaries and conclusions. Provides opportunity to develop necessary skills to effectively synthesize scientific evidence and write and communicate to a variety of scientific audiences. Designed for those who will encounter a spectrum of scientific writing throughout their careers.

**Prerequisite(s):** ENGW 3306 with a minimum grade of C or graduate program admission

**PHMD 5240. Integrated Social and Administrative Sciences 2. (4 Hours)**

Provides a foundation in research methodology, drug information skills, and evidence-based medicine in an interactive format. Emphasizes research designs used in experimental and observational studies, hypothesis testing, and basic biostatistics, along with the critical examination of articles to analyze research questions and methods related to validity, generalizability, and ethical issues in design and conduct. Uses clinical trials, observational studies, and problem sets to illustrate principles of research design, conduct, data analysis, and evaluation. Emphasizes development of applied drug information skills in formulary support, health informatics, medication error and adverse event reporting, and quality assurance, as well as writing for a variety of audiences (pharmacists, healthcare providers, and the lay public) and use of peer review.

**Prerequisite(s):** (PHMD 5140 with a minimum grade of D- ; PHMD 5182 with a minimum grade of D- ; PHMD 5192 with a minimum grade of D- ) or graduate program admission

**Attribute(s):** NUpath Ethical Reasoning, NUpath Natural/Designed World, NUpath Writing Intensive

**PHMD 5245. Integrated Social and Administrative Sciences 3. (4 Hours)**

Describes managerial, administrative, and leadership skills essential for a contemporary pharmacist. Uses general business principles as a foundation for applications to common pharmacy practice settings, with an emphasis on community and hospital pharmacy. Offers students opportunities to participate in projects and group work designed to facilitate understanding and applications of managerial, administrative, leadership, and entrepreneurship principles to pharmacy practice. Emphasizes enhanced development of applied drug information skills important to the pharmacist in areas of formulary support, health informatics, medication error and adverse event reporting, and quality assurance. Covers analysis and evaluation of laws, rules, and regulations controlling pharmacy practice related to medication dispensing.

**Prerequisite(s):** (PHMD 5240 with a minimum grade of D- ; PHMD 5283 with a minimum grade of D- ; PHMD 5293 with a minimum grade of D- ) or graduate program admission

**PHMD 5250. Pharmacy Care Management. (4 Hours)**

Focuses on the managerial and administrative skills required by a contemporary pharmacist practicing in either a community or hospital setting. Covers classical management principles of planning, decision making, organizing, hiring, and controlling. Case study methods are used as an interactive teaching tool. Also covers pertinent current events.

**Prerequisite(s):** PHMD 2350 with a minimum grade of C

**PHMD 5270. Economic Evaluation of Pharmaceuticals and Pharmacy Practice. (2 Hours)**

Introduces the principles of economic theory of healthcare markets and economic evaluation of health products and services. Economic theory topics include fundamentals of supply and demand, market structure, market failure, and the role of government. Economic evaluation topics include measuring costs and benefits of a specific treatment, types of formal decision analysis, ethical considerations, and implementation in the real world. Restricted to students with fifth-year PharmD standing.

**Prerequisite(s):** (PHMD 4631 with a minimum grade of C- or PHMD 4631 with a minimum grade of D- ); (PHMD 4632 with a minimum grade of C- or PHMD 4632 with a minimum grade of D- )

**PHMD 5282. Integrated Learning Lab 2. (1 Hour)**

Offers students an opportunity to develop and assimilate knowledge, skills, and attitudes related to the pharmaceutical care of patients to supplement and augment pharmacy curricular topics within an immersive learning experience. Includes pharmacology, medicinal chemistry, pathophysiology, and therapeutics of cardiovascular diseases. Uses innovative digital tools, environments, equipment, learning materials, and pedagogical methods that promote the development and refinement of problem-solving skills, adaptability/resilience, and a team mindset that can be applied during experiential activities (co-op/introductory pharmacy practice experience/advanced pharmacy practice experience), as well as future careers.

**PHMD 5283. Integrated Learning Lab 3. (1 Hour)**

Offers students an opportunity to develop and assimilate knowledge, skills, and attitudes related to the pharmaceutical care of patients to supplement and augment pharmacy curricular topics within an immersive learning experience. Includes pharmacokinetics; professional communication skills; drug information; jurisprudence; research methods; patient counseling; and pharmacology, immunology, medicinal chemistry, pathophysiology, and therapeutics of chronic rheumatologic, immune-mediated, dermatologic, and oncologic diseases. Uses innovative digital tools, environments, equipment, learning materials, and pedagogical methods that promote development and refinement of problem-solving skills, adaptability/resilience, and a team mindset that can be applied during experiential activities (co-op/introductory pharmacy practice experience/advanced pharmacy practice experience), as well as future careers.

**PHMD 5284. Integrated Learning Lab 4. (1 Hour)**

Offers students an opportunity to develop and assimilate knowledge, skills, and attitudes related to the pharmaceutical care of patients to supplement and augment pharmacy curricular topics within an immersive learning experience. Includes professional communication skills; drug information; management; jurisprudence; patient counseling; aseptic technique/compounding; and pharmacology, immunology, medicinal chemistry, pathophysiology, and therapeutics of acute and chronic infectious diseases. Uses innovative digital tools, environments, equipment, learning materials, and pedagogical methods that promote the development and refinement of problem-solving skills, adaptability/resilience, and a team mindset that can be applied during experiential activities (co-op/introductory pharmacy practice experience/advanced pharmacy practice experience), as well as future careers.

**PHMD 5285. Integrated Learning Lab 5. (1 Hour)**

Offers students an opportunity to develop and assimilate knowledge, skills, and attitudes related to the pharmaceutical care of patients to supplement and augment pharmacy curricular topics within an immersive learning experience. Includes professional communication skills; drug information; jurisprudence; patient counseling; pharmacology, medicinal chemistry, and pathophysiology; and therapeutics of acute and chronic neurologic, pain, and psychiatric diseases. Uses innovative digital tools, environments, equipment, learning materials, and pedagogical methods that promote the development and refinement of problem-solving skills, adaptability/resilience, and a team mindset that can be applied during experiential activities (co-op/introductory pharmacy practice experience/advanced pharmacy practice experience), as well as future careers.

**PHMD 5293. Concepts in Practice 3. (1 Hour)**

Applies concepts through activities designed to develop knowledge, skills, and attitudes focused on foundational aspects of pharmacy practice. Covers identification of drug-related problems, problem solving, and disease state management related to the pharmaceutical care of patients with a focus on pharmacokinetics and chronic rheumatologic, immune-mediated, dermatologic, and oncologic diseases. Reviews, discusses, synthesizes, and applies information from current and previous coursework and experiential activities in an active learning format.

**PHMD 5294. Concepts in Practice 4. (1 Hour)**

Applies concepts through activities designed to develop knowledge, skills, and attitudes focused on foundational aspects of pharmacy practice. Covers identification of drug-related problems, problem solving, and disease state management related to the pharmaceutical care of patients with a focus on acute and chronic infectious diseases. Reviews, discusses, synthesizes, and applies information from current and previous coursework and experiential activities in an active learning format.

**PHMD 5295. Concepts in Practice 5. (1 Hour)**

Applies concepts through activities designed to develop knowledge, skills, and attitudes focused on foundational aspects of pharmacy practice. Covers identification of drug-related problems, problem solving, and disease state management related to the pharmaceutical care of patients with a focus on acute and chronic neurologic pain and psychiatric diseases. Reviews, discusses, synthesizes, and applies information from current and previous coursework and experiential activities in an active learning format.

**PHMD 5320. APPE Readiness. (4 Hours)**

Designed to prepare students for Advanced Pharmacy Practice Experiences. Builds upon and assesses knowledge, skills, and attitudes developed during the first three years of the Doctor of Pharmacy curriculum. Offers learning activities and assessments that simulate student responsibilities during an APPE including interprofessional collaborations, caring for diverse patient populations in different settings, communicating with care team members, and assessing evidence to support informed recommendations and educational interventions for patients. Utilizes a continuous professional development and lifelong learning plan and reflection on skill development to set goals for APPE and postgraduation.

**Corequisite(s):** PHMD 5335

**Attribute(s):** NUpath Capstone Experience



**PHMD 5330. Jurisprudence. (3 Hours)**

Examines how federal and state regulatory bodies, statutes, laws, regulations, policies, guidance, and practice guides set the standard for the present-day practice of pharmacy.

**Prerequisite(s):** PHMD 4611 with a minimum grade of C- or PHMD 4611 with a minimum grade of C-

**PHMD 5335. Integrated Science and Therapeutics 7. (4 Hours)**

Integrates foundational concepts of pharmacology, medicinal chemistry, pathophysiology, and pharmacotherapeutics to treat patients with acute and chronic conditions with men's and women's health, endocrine, and thyroid disorders. Offers students an opportunity to develop knowledge, skills, and attitudes pertaining to drug action, drug-receptor interactions, structure-activity relationships, dose-response relationships, drug mechanisms of action, therapeutic uses, and adverse effects. Focuses on developing patient evaluation skills using the Pharmacists' Patient Care Process and identification of drug therapy problems. Emphasizes self-care, patient education, assessment, medication administration, management, and monitoring, as well as preventative health and population-based health outcomes.#.

**Prerequisite(s):** (PHMD 5220 with a minimum grade of D- ; PHMD 5285 with a minimum grade of D- ; PHMD 5295 with a minimum grade of D- ) or graduate program admission

**PHMD 5345. Integrated Social and Administrative Sciences 4. (4 Hours)**

Introduces the principles of economic theory of healthcare, pharmaceutical markets, and economic evaluation of health products and services. Economic theory topics include fundamentals of supply and demand, market structure, market failure, and the role of government, with a focus on pharmaceutical products and market. Economic evaluation topics include measuring costs and benefits of a specific treatment, types of formal decision analysis, ethical considerations, and implementation in the real world. Studies advanced development of applied drug information skills important to the pharmacist in areas of formulary support, health informatics, medication error and adverse event reporting, and quality assurance. Covers analysis and evaluation of laws, rules, and regulations controlling pharmacy practice related to medication dispensing.

**Prerequisite(s):** (PHMD 5245 with a minimum grade of D- ; PHMD 5285 with a minimum grade of D- ; PHMD 5295 with a minimum grade of D- ) or graduate program admission

**PHMD 5386. Integrated Learning Lab 6. (1 Hour)**

Offers students an opportunity to develop and assimilate knowledge, skills, and attitudes related to the pharmaceutical care of patients to supplement and augment pharmacy curricular topics within an immersive learning experience. Includes professional communication skills, drug information, jurisprudence, patient counseling, pharmacoeconomics, pharmacology, medicinal chemistry, pathophysiology, and therapeutics of acute and chronic conditions with men/women's health, endocrine, and thyroid disorders. Uses innovative digital tools, environments, equipment, learning materials, and pedagogical methods that promote the development and refinement of problem-solving skills, adaptability/resilience, and a team mindset that can be applied during experiential activities (co-op/introductory pharmacy practice experience/advanced pharmacy practice experience), as well as future careers.

**PHMD 5396. Concepts in Practice 6. (1 Hour)**

Applies concepts through activities designed to develop knowledge, skills, and attitudes focused on foundational aspects of pharmacy practice. Covers identification of drug-related problems, problem solving, and disease state management related to the pharmaceutical care of patients with a focus on acute and chronic conditions with men/women's health, endocrine, and thyroid diseases. Reviews, discusses, synthesizes, and applies information from current and previous coursework and experiential activities in an active-learning format.

**PHMD 5405. Hematology and Oncology Pharmacotherapy. (2 Hours)**

Emphasizes the role of pharmacotherapy in the management of hematologic and oncologic diseases. Provides a comprehensive overview of benign and malignant hematologic diseases and solid tumor malignancies, as well as their corresponding treatment modalities.

**PHMD 5450. Advanced Pharmacy Practice Experience Preparatory Seminar. (1 Hour)**

Offers students an opportunity to collect relevant information to make informed decisions concerning the selection of advanced pharmacy practice experiences (APPEs). Designed to provide new knowledge (e.g., what is expected of a P4 student) and to strengthen existing knowledge (e.g., from didactic courses) to offer a smooth transition from the didactic courses to APPEs.

**PHMD 5560. Applied Drug Information. (2 Hours)**

Offers students an opportunity to obtain the skills necessary to become effective providers of drug information. An effective provider assesses drug information needs and evaluates, applies, and communicates data from the published literature and other sources to optimize patient care. Designed to help students develop applied drug information skills important to the pharmacist in areas of formulary support, health informatics, medication error and adverse event reporting, and quality assurance. Students complete a variety of active learning exercises, including multiple evidence-based written drug information responses and a current events analysis. Emphasizes writing for a variety of audiences, including pharmacists, other healthcare providers, and the lay public, as well as use of peer review.

**Prerequisite(s):** ENGW 3306 with a minimum grade of C or graduate program admission

**Attribute(s):** NUPath Writing Intensive

**PHMD 5575. Pharmaceutical Industry. (2 Hours)**

Offers a global overview of pharmaceutical industry career options and pathways. Focuses on all major functions of the industry, such as clinical research and medical affairs. Additional areas covered include regulatory affairs, health economic and outcomes research, marketing, sales, scientific liaisons, and pharmacovigilance. Explores the phases of drug development and how these phases interact with different departments.

**PHMD 5600. Pharmacy Capstone. (4 Hours)**

Acts as a final integrator of the major, general education, and experiential aspects of the student's education. Expects students to demonstrate motivation and initiative and to work cooperatively with their faculty mentor, community partners, and fellow students (where applicable) in order to complete a comprehensive, high-quality scholarly work (e.g., a research project, educational project, administrative project, business plan, case report, or community-service learning project or professional manuscript) appropriate for dissemination to the university and professional community. The timeline for completion is set by the faculty mentor and agreed to by the individual or all members of the student group. May be repeated once.

**Attribute(s):** NUPath Capstone Experience, NUPath Writing Intensive

**PHMD 5800. Navigating Over-the-Counter Products and Self-Care Practices Inside and Outside the United States. (4 Hours)**

Offers health profession learners an opportunity to develop a basic understanding of health-delivery systems, specific to pharmacy practices, and key issues confronting healthcare inside and outside (e.g., Norway, Spain, Portugal, Australia, etc.) of the United States. Explores issues such as the delivery and affordability of medical care and pharmaceutical products, patient rights, health risks and behaviors, disease prevention, and quality and access to care. Compares and contrasts key healthcare issues inside and outside of the United States using literature resources, internet and contemporary media, observations in the study countries, discussions with guest speakers/cocurricular cultural events, and incorporation of self- and group-reflection activities.

**PHMD 5880. Special Topics. (2,3 Hours)**

Explores topics germane to medication and medication use, as established by the course instructor.

**PHMD 5976. Directed Study. (1-4 Hours)**

Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. May be repeated for up to 4 total credits.

**PHMD 5984. Research. (1-4 Hours)**

Offers an opportunity to conduct research under faculty supervision. May be repeated without limit.

**PHMD 6440. Internal Medicine Advanced Pharmacy Practice Experience. (6 Hours)**

Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patients in the hospital setting. In collaboration with other members of the healthcare team, and under the supervision of a clinical preceptor, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients.

**PHMD 6441. Acute Care Advanced Pharmacy Practice Experience. (6 Hours)**

Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patients. In collaboration with other members of the healthcare team, and under the supervision of a clinical preceptor, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients.

**PHMD 6442. Ambulatory Care Advanced Pharmacy Practice Experience. (6 Hours)**

Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patients in an ambulatory clinic environment. In collaboration with other members of the healthcare team, and under the supervision of a clinical preceptor, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients.

**PHMD 6443. Community Advanced Pharmacy Practice Experience. (6 Hours)**

Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patients in a community setting. In collaboration with other members of the healthcare team, and under the supervision of a clinical preceptor, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients.

**PHMD 6444. Internal Medicine Elective Advanced Pharmacy Practice Experience. (6 Hours)**

Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patients in the hospital setting. In collaboration with other members of the healthcare team, and under the supervision of a clinical preceptor, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. May be repeated once.

**PHMD 6445. Ambulatory Care Elective Advanced Pharmacy Practice Experience. (6 Hours)**

Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patients in an ambulatory clinic environment. In collaboration with other members of the healthcare team, and under the supervision of a clinical preceptor, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. May be repeated without limit.

**PHMD 6446. Psychiatry Advanced Pharmacy Practice Experience. (6 Hours)**

Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patients under psychiatric care. In collaboration with other members of the healthcare team, and under the supervision of a clinical preceptor, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. May be repeated without limit.

**PHMD 6447. Community Elective Advanced Pharmacy Practice Experience. (6 Hours)**

Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patients in a community setting. In collaboration with other members of the healthcare team, and under the supervision of a clinical preceptor, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. May be repeated without limit.

**PHMD 6448. Long-Term Care Advanced Pharmacy Practice Experience. (6 Hours)**

Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patients in a nursing home or rehabilitation center. Under the supervision of a clinical preceptor and, when appropriate, in conjunction with other members of the healthcare team, identifies appropriate drug therapy and monitoring requirements for common pathophysiologic processes and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. May be repeated up to nine times.

**PHMD 6449. Geriatrics Advanced Pharmacy Practice Experience. (6 Hours)**

Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patients in a geriatric practice setting. Under the supervision of a clinical preceptor, and, when appropriate, in conjunction with other members of the healthcare team, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. May be repeated without limit.

**PHMD 6450. Pediatrics Advanced Pharmacy Practice Experience. (6 Hours)**

Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patients in a pediatric practice setting. Under the supervision of a clinical preceptor, and, when appropriate, in conjunction with other members of the healthcare team, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. May be repeated without limit.

**PHMD 6451. Neonatology Advanced Pharmacy Practice Experience. (6 Hours)**

Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patients in a neonatal practice setting. Under the supervision of a clinical preceptor, and, when appropriate, in conjunction with other members of the healthcare team, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. May be repeated without limit.

**PHMD 6452. Critical Care Advanced Pharmacy Practice Experience. (6 Hours)**

Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patients in a critical-care practice setting. Under the supervision of a clinical preceptor, and, when appropriate, in conjunction with other members of the healthcare team, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. May be repeated without limit.

**PHMD 6453. Surgery Advanced Pharmacy Practice Experience. (6 Hours)**

Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patients in a surgical practice setting. Under the supervision of a clinical preceptor, and, when appropriate, in conjunction with other members of the healthcare team, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. May be repeated without limit.

**PHMD 6454. Cardiology Advanced Pharmacy Practice Experience. (6 Hours)**

Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patients in a cardiology practice setting. Under the supervision of a clinical preceptor, and, when appropriate, in conjunction with other members of the healthcare team, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. May be repeated without limit.

**PHMD 6456. Drug Information Advanced Pharmacy Practice Experience. (6 Hours)**

Applies drug information skills to site-specific drug information requests under the supervision of a clinical preceptor, and, when appropriate, in conjunction with other members of the site team. Using appropriate sources, the student analyzes drug information findings, such as dosing, monitoring, indications, efficacy, and adverse drug reactions. May be repeated without limit.

**PHMD 6457. Oncology Advanced Pharmacy Practice Experience. (6 Hours)**

Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patients in an oncology practice setting. Under the supervision of a clinical preceptor, and, when appropriate, in conjunction with other members of the healthcare team, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. May be repeated without limit.

**PHMD 6461. Infectious Disease Advanced Pharmacy Practice Experience. (6 Hours)**

Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patients on an infectious disease consult service. Under the supervision of a clinical preceptor, and, when appropriate, in conjunction with other members of the healthcare team, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. May be repeated without limit.

**PHMD 6462. Pharmacy Industry Advanced Pharmacy Practice Experience. (6 Hours)**

Focuses on the application of regulatory affairs and healthcare principles in the pharmaceutical industry. Under the supervision of a preceptor, and, when appropriate, in conjunction with other members of the site team, participates in appropriate activities, such as drug research and development, marketing, medical affairs, regulatory affairs, and information service. May be repeated without limit.

**PHMD 6463. Pharmacy Administration Advanced Pharmacy Practice Experience. (6 Hours)**

Applies healthcare and management principles, with emphasis on pharmacy administration, under the supervision of a preceptor, and, when appropriate, in conjunction with other members of the site team. May be repeated without limit.

**PHMD 6464. Regulatory Advanced Pharmacy Practice Experience. (6 Hours)**

Participates in appropriate activities including but not limited to principles of and compliance with pharmacy law and review of regulations governing the FDA's mandatory reporting of adverse drug reactions under the supervision of a preceptor, and, when appropriate, in conjunction with other members of the site team. In addition, students may have the opportunity to be given a step-by-step introduction to public record laws, Board Regulations at 247 CMR, and pharmacy statutes at Massachusetts General Laws, Chapter 112, 24(A)–42(A). May be repeated without limit.

**PHMD 6465. Managed Care Advanced Pharmacy Practice Experience. (6 Hours)**

Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patients in a managed-care practice setting. Under the supervision of a clinical preceptor, and, when appropriate, in conjunction with other members of the healthcare team, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. May be repeated without limit.

**PHMD 6466. Transplantation Advanced Pharmacy Practice Experience. (6 Hours)**

Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patients in a transplantation unit. Under the supervision of a clinical preceptor, and, when appropriate, in conjunction with other members of the healthcare team, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. May be repeated without limit.

**PHMD 6467. Directed Practice Advanced Pharmacy Practice Experience. (6 Hours)**

Offers nontraditional experience with an approved preceptor at an appropriate site. Based on availability. May be repeated without limit.

**PHMD 6468. International Advanced Pharmacy Practice Experience. (6 Hours)**

Offers an international experience with an approved preceptor at an appropriate site. Based on availability. May be repeated up to four times.

**PHMD 6469. Management Advanced Pharmacy Practice Experience. (6 Hours)**

Offers students an opportunity to apply healthcare and management principles, with an emphasis on pharmacy management, under the supervision of a preceptor and, when appropriate, in conjunction with other members of the site management team. May be repeated up to two times.

**PHMD 6470. Education Advanced Pharmacy Practice Experience. (6 Hours)**

Offers students an opportunity to teach in the pharmacy curriculum under the supervision of a faculty member. Students have an opportunity to examine how teachers use experience-based and problem-based approaches to engage the range of student learners (third- through fifth-year pharmacy students) to attain their learning goals. May be repeated up to two times.

**PHMD 6471. Research 1 Advanced Pharmacy Practice Experience. (6 Hours)**

Offers students interested in gaining basic or clinical research experience an opportunity to work under the direction of an experienced researcher at an appropriate site. Students can elect either a basic science (lab-based) preceptor or a clinical (patient-based) preceptor. Students can expect to be an active participant in a variety of different research activities and experiences that are deemed appropriate by the preceptor. The research efforts of the student may result in a peer-reviewed research abstract and/or presentation. May be repeated up to two times.

**PHMD 6962. Elective. (1-4 Hours)**

Offers elective credit for courses taken at other academic institutions. May be repeated without limit.

**PHMD 6964. Co-op Work Experience. (0 Hours)**

Provides eligible students with an opportunity for work experience. May be repeated without limit.