

# Pharmacy Practice (PHMD)

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## **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 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 2030. Resiliency: Bounce, Grow, Connect, and Flow. (2 Hours)**

Introduces students to new ways of dealing with adversity that may benefit them in all facets of life and identifies behaviors that promote resilience and well-being. Healthcare professional burnout is a highly prevalent issue and is recognized as a public health crisis. Reduction in individual burnout can be accomplished through personal well-being and resilience development among professionals and students. Survey completion and reflection activities are designed to encourage students' self-awareness of stress and weakness. Exposes students to common well-being activities through experimentation with each practice, such as yoga, meditation, and food journaling.

## **PHMD 2100. Entrepreneurship in Health Sciences. (4 Hours)**

Addresses principles and applications of entrepreneurship in the healthcare industry, focusing on healthcare ventures and technology. Explores different business organizations, including sole proprietorships, partnerships, corporations, joint ventures and not-for-profit enterprises. Such explorations offer students an opportunity to identify and evaluate business skills and commitment necessary to successfully operate an entrepreneurial venture and address the challenges and rewards of entrepreneurship. Considers the requirements, costs, and benefits of various forms of financial options open to entrepreneurs. Presentations and discussions are led by accomplished entrepreneurs and practitioners engaged in healthcare teaching, research, and business. Case studies identify the challenges and rewards of successful entrepreneurial ventures that set positive examples for budding entrepreneurs in leading change and innovation.

## **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 2550. Innovation, Entrepreneurship, and Drug and Medical Device Development. (4 Hours)**

Introduces the process of innovation and entrepreneurship within drug and medical device development. Explores the perspectives of the pharmaceutical industry and medical device industry, as well as regulatory agencies, within the United States. Presents drug/device discovery, development, deployment, and life cycle as it pertains to business development and planning. Examines the roles of individuals in innovation and entrepreneurship across the industry.

**PHMD 2940. History of Pharmacy and Professional Leadership. (2 Hours)**

Explores the history of the profession of pharmacy, with a particular focus on the development of patient care aspects of the profession from the mid-20th century to the present. Engages in comparative reviews of major historical events that shaped the post-industrialization clinical pharmacy movement and the leaders and groups responsible for advancing the movement. Offers opportunities for students to identify and refine their own leadership abilities and prepare to influence the future of the profession with perspectives gained from historical and current events along with emerging opportunities.

**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.

**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 1111 with a minimum grade of C or ENGL 1102 with a minimum grade of C or ENGL 1102 with a minimum grade of C or ENGW 1111 with a minimum grade of C or ENGW 1102 with a minimum grade of C or graduate program admission

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

**PHMD 3600. Leadership and Advocacy in Health Professions. (2 Hours)**

Designed to help facilitate successful careers of young healthcare professionals and expand students' knowledge of their leadership potential. Consists primarily of topic discussions that include a variety of issues related to professional development, focusing on leadership, organizational and relational skills, and advocacy. Covers global issues in leadership and advocacy. Encourages students to recognize the need for leadership in health professions and the ability of practitioners to influence change regardless of whether they have a title or position of authority. Seeks to be valuable to students with interests in administrative positions in various settings, including in high-level clinical positions, and to students who plan to pursue postgraduate training.

**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)**

Seeks to prepare pharmacy students to become more confident and effective as educators. Also seeks to increase the student's awareness of academic careers and the roles and responsibilities that faculty play in the class, department, and school of pharmacy. The knowledge, skills, and attitudes discussed and explored in this course are applicable across the profession of pharmacy regardless of practice setting. Restricted to students with fifth-year standing.

**PHMD 4581. Cancer Chemotherapy. (2 Hours)**

Emphasizes the role of chemotherapy in the management of malignant disease. Reviews specific antineoplastic agents, specific malignancies, and related topics. Focuses throughout the course on supportive care for the cancer patient.

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

**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.

**Prerequisite(s):** PHMD 3450 with a minimum grade of D- or PHMD 3450 with a minimum grade of C- (Graduate)

**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.

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

**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.

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

**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 4991. Research. (4 Hours)**

Extends current knowledge or offers novel insights through faculty-directed and supervised individual undergraduate research or creative projects. The project must be designed in concert with and obtain formal prior approval from relevant faculty and program director. May be repeated without limit.

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

**PHMD 4992. 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 without limit.

**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):** (PHMD 3450 with a minimum grade of C or PHMD 3450 with a minimum grade of C); (ENGW 3306 with a minimum grade of C or graduate program admission)

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

**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 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 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):** PHMD 3450 with a minimum grade of D-; (ENGW 3306 with a minimum grade of C or graduate program admission)

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

**PHMD 5571. Pharmaceutical Industry—An Introduction. (1 Hour)**

Presents a general overview of pharmaceutical industry functional areas. Focuses on areas that host national postgraduate training programs. Introduces all major functions of industry, such as clinical research, medical affairs, regulatory affairs, health economic and outcomes research, marketing, sales, medical science liaisons, business development, and pharmacovigilance. Explores the phases of drug development and how these phases interact with different departments.

**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 5675. Ambulatory Care Pharmacy Practice in Urban Health. (2 Hours)**

Introduces various aspects of ambulatory care pharmacy practice and social, economic, cultural, and psychological intricacies. Covers chronic disease management and prevention and wellness. Offers students an opportunity to gain insight into the pharmacist's role as part of a patient-centered medical home model and/or an interdisciplinary primary care team, with an emphasis on urban health.

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

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

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

**PHMD 5900. Self-Care and Nonprescription Medications: A Team-Based Approach. (2 Hours)**

Focuses on the clinical use, safety, and efficacy of common nonprescription medications and complementary alternatives (vitamins, minerals, supplements, herbals, etc.) used in the outpatient setting to treat minor medical problems. Pharmacists are often approached by members of the community to recommend treatments for common ailments. It is important for pharmacists to quickly and accurately assess patients to determine if they are candidates for self-care or if a referral to another healthcare provider is warranted. Offers students an opportunity to develop the necessary skills to determine if self-care treatment is an option for patients and to make appropriate self-care and nonprescription product selection recommendations based on the assessment of a patient's health status, medical problems, and current practice of self-treatment through case-based examples.

**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.

**Prerequisite(s):** PHMD 6440 (may be taken concurrently) with a minimum grade of C

**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.

**Prerequisite(s):** PHMD 6442 with a minimum grade of C

**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, 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 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)**

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

**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 6472. Research 2 Advanced Pharmacy Practice Experience. (6 Hours)**

Offers students an opportunity to further develop research skills and experience gained in PHMD 6471. Intended for those students interested in pursuing a postgraduate research training program (e.g., fellowship or graduate school). The research efforts of the student in the course may result in authorship opportunities on a peer-reviewed research abstract and/or manuscript. May be repeated up to two times.

**Prerequisite(s):** PHMD 6471 (may be taken concurrently) with a minimum grade of C

**PHMD 6473. Radiopharmacy Advanced Pharmacy Practice Experience. (6 Hours)**

Offers students an opportunity to examine the application of radiopharmaceuticals in medical imaging methods. Includes but is not limited to computed tomography (CT), magnetic resonance imaging (MRI), positron emission tomography (PET), and single-photon tomography (SPECT). Students completing this course may cover aspects of product preparation, administration, and data interpretation. May be repeated up to two times.

**PHMD 6474. Public Health Advanced Pharmacy Practice Experience. (6 Hours)**

Offers students an opportunity to apply knowledge of public health and policy skills to site-specific needs to advance pharmacy practice within the health system. Seeks to increase knowledge in the principles of public health, with opportunities to work on program implementation and evaluation, policy formation, public health research, and participate in planning and administrative meetings within the public health environment. Offers each student an opportunity to participate as a member of a team to complete group and individual assignments. 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.

**PHMD 6999. Advanced Pharmacy Practice Continuation. (0 Hours)**

Continues clinical requirements.