

School of Pharmacy

Degrees Offered

- Doctor of Pharmacy (Pharm.D.)
- Doctor of Philosophy (Ph.D.)

Introduction

The mission of the West Virginia University (WVU) School of Pharmacy is to improve the health and well-being of West Virginians and society at large through pharmacy education, research, practice, and service.

Pharmacy was first offered at West Virginia University as a department in the School of Medicine in 1914. The College of Pharmacy emerged as a separate entity in 1936 and became the School of Pharmacy in 1958. In 1960, the School of Pharmacy changed from a four-year to a five-year program and in 1998 to a six-year program. The doctor of pharmacy (Pharm.D.) program comprises four years of professional study preceded by a minimum of two years of pre-pharmacy study in an accredited U.S. or Canadian college of arts and sciences.

Many pharmacy graduates enter practice in community or institutional pharmacies; postgraduate pharmacy residency programs offer the opportunity for additional training and experience in general pharmacy practice and in several areas of specialty practice. Positions are also available in various government agencies, the pharmaceutical industry, long-term care, nuclear pharmacy, home health-care organizations and many other areas. Pharmacists are eligible for commissions in the armed forces and the U.S. Public Health Service. Pharmacists also may prepare for careers in teaching and research.

The WVU School of Pharmacy also offers Ph.D. programs in health services and outcomes research and the pharmaceutical and pharmacological sciences.

Accreditation

The School of Pharmacy is fully accredited by the Accreditation Council for Pharmacy Education, the national agency for the accreditation of professional degree programs in pharmacy. The Council is composed of members from the American Pharmacists Association, the National Association of Boards of Pharmacy, the American Association of Colleges of Pharmacy, and the American Council on Education.

The School of Pharmacy holds membership in the American Association of Colleges of Pharmacy, whose mission is to lead and partner with member institutions in advancing pharmacy education, research, scholarship, practice, and service to improve societal health.

ADMINISTRATION

DEAN

- William P. Petros - Pharm.D. (Philadelphia College of Pharmacy and Science)

ASSOCIATE DEAN FOR ACADEMIC AFFAIRS AND EDUCATIONAL INNOVATION

- Mary K. Stamatakis - Pharm.D. (The Ohio State University)
Professor, Department of Clinical Pharmacy

ASSOCIATE DEAN FOR STUDENT SERVICES

- Mary L. Euler - Pharm.D. (University of Missouri-Kansas City School of Pharmacy)
Professor, Department of Clinical Pharmacy

ASSOCIATE DEAN FOR RESEARCH AND GRADUATE PROGRAMS (INTERIM)

- Paul R. Lockman - Ph.D. (Texas Tech University Health Sciences Center)
Chair, Department of Pharmaceutical Sciences

FACULTY

PROFESSORS

- Marie A. Abate - Pharm.D. (University of Michigan)
Department of Clinical Pharmacy, Director, West Virginia Center for Drug and Health Information
- Patrick S. Callery - Ph.D. (University of California)
Department of Pharmaceutical Sciences
- Vincent Castranova - Ph.D. (West Virginia University)

Department of Pharmaceutical Sciences

- David P. Elliott - Pharm.D. (University of Texas)
Department of Clinical Pharmacy, Associate Chair for the Charleston Division
- Lori A. Hazlehurst - Ph.D. (University of Vermont)
Department of Pharmaceutical Sciences
- Gerald M. Higa - Pharm.D. (University of the Pacific)
Department of Clinical Pharmacy and Hematology/Oncology
- Jason D. Huber - Ph.D. (Florida A&M)
Department of Pharmaceutical Sciences
- S. Suresh Madhavan - Ph.D. (Purdue University)
Chair, Department of Pharmaceutical Systems and Policy
- William P. Petros - Pharm.D. (Philadelphia College of Pharmacy & Science)
Department of Pharmaceutical Sciences
- Charles D. Ponte - Pharm.D. (University of Utah)
Departments of Clinical Pharmacy and Family Medicine
- Yongyut Rojanasakul - Ph.D. (University of Wisconsin)
Department of Pharmaceutical Sciences
- Usha Sambamoorthi - Ph.D. (University of Madras)
Department of Pharmaceutical Systems and Policy
- Elizabeth J. Scharman - Pharm.D. (Virginia Commonwealth University/Medical College of Virginia)
Department of Clinical Pharmacy, Charleston Division. Director, West Virginia Poison Center
- Terrence L. Schwinghammer - Pharm.D. (Purdue University)
Chair, Department of Clinical Pharmacy
- Ginger Scott - Ph.D. (University of Minnesota)
Department of Pharmaceutical Systems and Policy
- Douglas Slain - Pharm.D. (Duquesne University)
Department of Clinical Pharmacy
- Mary K. Stamatakis - Pharm.D. (The Ohio State University)

ASSOCIATE PROFESSORS

- Robert K. Griffith - Ph.D. (The Ohio State University)
Department of Pharmaceutical Sciences
- Werner J. Geldenhuys - Ph.D. (North-West University, South Africa)
Department of Pharmaceutical Sciences, Associate Chair
- Allie Karshenas - Ph.D. (University of Southern Mississippi)
Department of Pharmaceutical Systems and Policy
- Kimberly M. Kelly - Ph.D. (Rutgers University)
Department of Pharmaceutical Systems and Policy
- Grazyna Szklarz - Ph.D. (Clarkson University)
Department of Pharmaceutical Sciences
- Erin Winstanley - Ph.D. (The John Hopkins Bloomberg School of Public Health)
Department of Pharmaceutical Systems and Policy

CLINICAL ASSOCIATE PROFESSORS

- Gina M. Baugh - Pharm.D. (University of Pittsburgh)
Department of Clinical Pharmacy. Director, Introductory Pharmacy Practice Experiences
- Matthew Blommel - Pharm.D. (Mercer University)
Department of Clinical Pharmacy
- Krista D. Capehart - Pharm.D. (University of Michigan)
Department of Clinical Pharmacy. Director, Wigner Institute for Advanced Pharmacy Practice
- Betsy M. Elswick - Pharm.D. (West Virginia University)
Department of Clinical Pharmacy
- Lena M. Maynor - Pharm.D. (West Virginia University)
Department of Clinical Pharmacy. Director, Advanced Pharmacy Practice Experiences
- Christopher M. Terpening - Ph.D. (University of Colorado)
Department of Clinical Pharmacy
- Tara R. Whetsel - Pharm.D. (West Virginia University)

Department of Clinical Pharmacy

- Jon P. Wietholter - Pharm.D. (University of Pittsburgh)
Department of Clinical Pharmacy

CLINICAL ASSISTANT PROFESSORS

- Ashleigh L. Barrickman - Pharm.D. (West Virginia University)
Department of Clinical Pharmacy, Director of Skills Development
- Jennifer Confer - Pharm.D. (University of Arizona)
Department of Clinical Pharmacy
- Gretchen M. Garofoli - Pharm.D. (University of Pittsburgh)
Department of Clinical Pharmacy
- Franklin Huggins - Pharm.D. (University of Utah)
Department of Clinical Pharmacy
- John (Jay) Martello - Pharm.D. (Duquesne University)
Department of Clinical Pharmacy
- Ashlee McMillan - Pharm.D. (West Virginia University)
Department of Clinical Pharmacy
- Jeremy J. Prunty - Pharm.D. (West Virginia University)
Department of Clinical Pharmacy
- Travis G. White - Pharm.D. (West Virginia University)
Department of Clinical Pharmacy. Director, Health Education Center

ASSISTANT PROFESSORS

- Erik A. Bey - Ph.D. (Cleveland State University)
Department of Pharmaceutical Sciences
- Wei Du - Ph.D. (Tohoku University School of Medicine, Japan)
Department of Pharmaceutical Sciences
- Nilanjana Dwibedi - Ph.D. (University of Houston)
Department of Pharmaceutical Systems and Policy
- Traci J. LeMasters - Ph.D. (West Virginia University)
Department of Pharmaceutical Systems and Policy
- Mohammed A. Nayeem - Ph.D. (Osmania University, India)
Department of Pharmaceutical Sciences
- Xi Tan - Ph.D. (University of Michigan)
Department of Pharmaceutical Systems and Policy

TEACHING ASSISTANT PROFESSOR

- Marina Galvez Peralta - Ph.D. (University of Seville, Spain)
Department of Pharmaceutical Sciences

Degree Designation Learning Goals

DOCTOR OF PHARMACY (PHARMD)

Upon successful completion of the West Virginia University Doctor of Pharmacy degree program, the graduate will be able to accomplish the following educational outcomes (EOs):

EO 1 Foundational Knowledge and Skills (Learner) - Develop, integrate, and apply foundational knowledge (e.g., concepts, facts, principles) from biological, pharmaceutical, social, behavioral, administrative, and clinical sciences to evaluate the scientific literature, explain drug actions, solve therapeutic problems, and advance individual and population health.

- Acquire and demonstrate depth and breadth of knowledge of foundational scientific, clinical, socioeconomic, and humanistic concepts and skills.
- Explain how knowledge in the foundational sciences is integral to pharmacy practice.
- Integrate knowledge from foundational sciences to explain how specific drugs or drug classes work and evaluate their potential value in individuals and populations.
- Apply foundational concepts and skills to practice.
- Use scientific reasoning and critical thinking skills in practice to address problems, issues, or concerns.
- Develop and apply creative and innovative approaches to effectively resolve problems and improve patient outcomes.

- Apply an evidence-based approach to practice by identifying appropriate questions to address, using databases and other resources to retrieve information, critically analyzing and interpreting relevant scientific information and other evidence, formulating sound conclusions, and integrating the best published evidence with expertise and individual patient values/needs.
- Analyze and use epidemiologic, pharmaco-economic, medication utilization, and quality improvement data when developing evidence-based programs and protocols.
- Apply knowledge of research methodology to design or conduct basic research, practice-based studies, or clinical trials.
- Use information technology where appropriate to enhance individual knowledge and skills.

EO 2 Communication Skills (Communicator, Educator) – Effectively communicate verbally and nonverbally when interacting with an individual, group, or organization.

- Use appropriate verbal and nonverbal communication skills with individuals or groups, including patients, health professionals and others.
- Use effective written communication skills with patients, health professionals, and others, including the development of documents pertinent to professional or organizational needs (e.g., monographs, reports).
- Educate target audiences by using the most effective method to deliver information, in coordination with other health care professionals as appropriate.
- Use technology to facilitate or enhance professional communications and presentations.

EO 3 Professionalism, Advocacy, and Leadership (Professional, Leader, Advocate) - Exhibit behaviors and values consistent with the professional trust given by patients, healthcare providers, and society; assure that patients' best interests are represented; and demonstrate responsibility for achieving shared goals regardless of position.

- Conduct pharmacy practice duties and patient care responsibilities in accordance with applicable federal, state, and local laws, statutes, and regulations, as well as professional guidelines and standards.
- Serve as an advocate, leader, and change agent for pharmacy and pharmacists' professional roles and responsibilities by implementing or participating in new, evidence-based models for cost-effective pharmacist-delivered patient care.
- Serve as an advocate for community and patient health and medication therapy needs, including disadvantaged or underserved patients and those from diverse cultural and socioeconomic backgrounds, while honoring their autonomy and dignity.
- Serve as a positive role model in actions/communications for peers and other health care providers by maintaining a high standard for personal and professional demeanor and ethical conduct.
- Respect all points of view in professional interactions while placing patients' needs and desires at the forefront.
- Demonstrate compassion, empathy, honesty, integrity, ethical behavior and altruism in all actions and communications with patients, families, and care providers.
- Develop professional competence through ongoing, active and self-directed pursuit of new knowledge and skills.
- Identify and analyze emerging health care and pharmacy issues and incorporate new roles, products and services into practice that can improve patient outcomes.
- Accept accountability and responsibility for one's words and actions.

EO 4 Self-Awareness (Insightful) – Examine and assess personal knowledge, skills, abilities, attitudes, beliefs, motivation, and emotions and strive for continual improvement.

- Conduct self-assessments on a regular basis and create, implement, evaluate, and modify as needed plans for personal improvement and continuing professional development.
- Recognize personal strengths and limitations and seek assistance when needed.
- Approach tasks and situations with flexibility and a desire to learn.
- Accept constructive criticism and display a willingness to correct and learn from errors.

EO 5 Interprofessional Collaboration (Collaborator) – Actively participate as a healthcare team member by demonstrating mutual respect, understanding, and values to meet patient care needs.

- Collaborate with health care professionals, patients, and/or caregivers to ensure that desired patient-specific or population-based health outcomes are achieved.
- Facilitate team building among health care professionals by developing and maintaining an atmosphere of mutual respect and shared values that place the patient at the forefront.
- Effectively utilize the knowledge, expertise, and unique roles of health care team providers and refer patients to others when indicated.
- Serve as the medication expert on a collaborative care team by managing the pharmacotherapy for patients' medical conditions and by proactively providing drug product and other medication related information to team members.
- Accept responsibility for medication-related outcomes on the care team.

EO 6 Patient Care (Provider) – Provide patient-centered care as the medication expert.

- Accurately interpret, prepare and/or compound, handle and dispense prescriptions for patients.
- Obtain necessary patient-specific data (e.g., consulting patient records, taking medication histories, performing basic physical assessments, ordering/interpreting lab tests), and evaluate and use these data when performing patient care related responsibilities.
- Evaluate pharmaceutical products, including information about the drug, dosage form, delivery system and cost/benefit, when conducting a medication review or preparing a care plan.
- Conduct comprehensive medication reviews and prepare individualized care plans to optimize patient outcomes, with emphasis on commonly encountered chronic or high risk conditions amenable to pharmacotherapy and patients at greater risk for adverse events.
- Work with patients, caregivers, and health care professionals to implement specific therapy plans.
- Educate and empower patients to take an active role in their health and incorporate recommendations for healthy living and self-care into care plans.
- Monitor and evaluate patients during therapy for drug product or pharmacotherapy problems, patient concerns, or adherence issues and recommend or implement solutions.
- Work with patients and other health care providers to ensure the continued success of individual care plans.
- Document patient-care services in charts/medical records and on forms needed for reimbursement.
- Counsel patients and/or caregivers about the following to help ensure a care plan's success: i) medications, non-drug therapy, dietary supplements and natural products; ii) insurance and other options for obtaining necessary medications; iii) proper use of testing devices and medical goods and equipment; and iv) healthy lifestyle changes.

EO 7 Population-Based Care (Promoter, Provider) – Design and implement prevention, intervention, and educational strategies for communities to manage chronic disease and improve health and wellness.

- Develop, recommend, and provide preventive health services, such as administration of vaccines and screening tests.
- Develop and implement disease management programs based upon identified needs and priorities (e.g., cost, access, and patient satisfaction considerations; commonly encountered, chronic conditions managed by pharmacotherapy).
- Evaluate and adjust interventions as needed to maximize population health.
- Promote public awareness of health promotion and disease prevention strategies.
- Design, develop, and disseminate public health related educational materials or services in a culturally competent manner.
- Work with health care professionals and other personnel to identify and help resolve key public health issues and problems, and participate in policies or strategies to address them.

EO 8 Pharmacy and Medication Use Systems (Manager) – Manage patient healthcare needs using human, financial, technological, and physical resources to optimize the safety and efficacy of medication use systems.

- Demonstrate knowledge of pharmacy management including operations, human and fiscal resources, marketing, and leadership principles.
- Design, use, and manage systems to prepare, dispense, distribute and administer medications to optimally serve patient's drug-related needs.
- Use knowledge of the organization and financing of the U.S. healthcare system to provide and effectively manage progressive pharmacy services.
- Develop a business plan for integrating clinical and distributive services that includes methods for supporting and obtaining reimbursement for clinical services provided to patients.
- Demonstrate and apply knowledge of national standards, guidelines, best practices, and established principles and processes for safe medication use to protect patient safety.
- Participate in quality improvement programs and employ performance indicators to enhance the quality of care and cost effectiveness of services provided and to optimize safe, appropriate medication use.
- Participate in developing and performing medication use evaluations to identify and resolve drug therapy problems or concerns.
- Reconcile a patient's medications when transitioning from one care setting to another by communicating effectively with all involved health care professionals.
- Use current and emerging information and system technologies to enhance safe and effective medication use.
- Provide recommendations for developing and managing a formulary that incorporate pharmacoeconomic principles.
- Actively participate in, and contribute to the development of, strategies to minimize drug misuse/abuse.

DOCTOR OF PHILOSOPHY (PHD)

The overall goals of the PhD program in Health Services and Outcomes Research are:

- To educate and train highly qualified individuals to pursue independent research in health services and outcomes research (HSOR) within interdisciplinary teams, and to function and contribute as a member of a research team.
- To prepare competent scientists able to contribute to health-related research, industrial research and development, pharmaceutical education, and scholarship.
- To advance research in pharmaceutical and healthcare delivery.
- To provide leadership for the pharmacy profession in research, graduate education, and health policy making.

The program is designed to prepare students to become independent researchers. Students will develop competencies in the scientific research process through didactic studies and conceptualizing, designing, conducting, and reporting original research.

Didactic Studies

- To learn basic principles and apply these principles to specific disciplines and related fields to cultivate a broad background of knowledge.
- To develop research skills, including scientific communication and critical thinking/problem solving abilities by participating in seminars and designated research skill courses.

Research Training

- To acquire practical experience in conducting original research, including acquisition of background information (e.g. literature research), problem development, experimental design and experimentation, collecting primary data and using secondary data, and data analyses.
- To foster research communication skills by writing abstracts for research presentations, manuscripts for publication, research grant proposals, and a thesis or dissertation.
- To gain additional insight into research and scholarship by participating in scholarly exchanges with faculty and students in the WVU School of Pharmacy, the Health Sciences Center (HSC), as well as the national and international healthcare community.

DOCTOR OF PHILOSOPHY (PHD)

Student Learning Outcomes of the Pharmaceutical & Pharmacological Sciences graduate education program are focused on preparing students to become independent researchers. To be successful in our program, students will need to develop competencies in the scientific research process through didactic studies in an area of emphasis and then conceptualizing, designing, conducting, and reporting original research.

Student Learning Outcomes

- Learn basic and applied principles in specific disciplines and related fields in order to develop a broad background of knowledge.
- Develop research skills including scientific communication and critical thinking/problem solving ability by participating in seminars and designated research skill courses.
- Gain hands-on experience in conducting original research, including acquisition of background information (e.g. literature research), experimental design and experimentation.
- Develop research communication skills by writing abstracts for research presentations, manuscripts for publication, research grant proposals, and a thesis or dissertation.
- Gain additional insight into research and scholarship by participating in scholarly exchanges with faculty and students in the WVU School of Pharmacy, the Health Sciences Center (HSC), and the West Virginia University community.
- Be able to pursue independent research in specialized fields in interdisciplinary teams and to function and contribute as members of research teams
- Be competent scientists that are able to contribute to health-related research, industrial research and development, pharmaceutical education, and scholarship

COURSES

PHAR 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

PHAR 693. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

PHAR 694A-Z. Seminar. 1-6 Hours.

Seminars arranged for advanced graduate students. (Grading may be S/U.).

PHAR 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

PHAR 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

PHAR 700. Pharmacy as a Profession. 1 Hour.

PR: First professional year standing or consent. Introduces students to the concept of professionalism, the scope of pharmacy practice opportunities, the health care system as it relates to pharmacy, and other contemporary issues in pharmacy practice. (Grading will be S/U.).

PHAR 701. Pharmaceutical Care Lab 1. 2 Hours.

PR: First professional year standing or consent. Students will develop skills in medical terminology, communications, information retrieval, dispensing, compounding, calculations, pharmaceutical care, and problem-solving skills.

PHAR 702. Pharmaceutics 1. 3 Hours.

PR: First professional year standing or consent. Introduces drug physical-chemical characteristics relevant to the design and performance of delivery systems. Pharmaceutical dosage forms taught include disperse and polydisperse systems (suspensions, emulsions, creams, ointments, aerosols and transdermals).

PHAR 703. Pharmacy Practice Experience 1. 1 Hour.

PR: First professional year standing or consent. Provides an overview of the roles and responsibilities of community pharmacists and provides experiential learning in a community pharmacy setting. First course in a six-semester sequence that introduces students to various pharmacy practice settings.

PHAR 704. Introduction to Research. 1 Hour.

Provides pharmacy students with a forum for the discussion of a wide variety of research activities and careers. Also provides an appreciation for the science on which the pharmacy profession is based and continually evolves.

PHAR 706. Biopharmaceutics. 2 Hours.

Introduces the fundamental principles of biopharmaceutics. This area of knowledge deals with the drug performance at the delivery system – human body interface, and addresses how physico-chemical drug properties, delivery system characteristics, and physiological processes influence drug distribution and affect the body, as well as drug bioavailability.

PHAR 707. Drug-Induced Diseases. 2 Hours.

Focused study of adverse effects of prescription and non-prescription medications designed for practical application across multiple disease states.

PHAR 708. Pharmaceutics 2. 3 Hours.

PR: PHAR 702. Continuation of PHAR 702. Solids dosage forms (tablets, capsules, sustained-release), regulatory pathways for marketing drugs, and biopharmaceutical principles (dosage form behavior in body).

PHAR 709. Immunology and Biotechnology. 2 Hours.

PR: First year professional standing or consent. Students will learn basic functions of the immune system, elements of the pharmaceutical applications of biotechnology, and be introduced to the chemotherapy of infections.

PHAR 710. Pharmacy Practice Experience 2. 1 Hour.

PR: PHAR 703 or consent. Provides an overview of the roles and responsibilities of community pharmacists and provides experiential learning in a community pharmacy setting. Second course in a six-semester sequence that introduces students to various pharmacy practice settings.

PHAR 711. Chemical Properties of Drugs. 2 Hours.

PR: First year professional standing or consent. Principles of chemical stability and chemical properties as they relate to drug molecules. Topics to be covered include functional group analysis, solubility, oil/water partitioning, organic acids and bases, and drug decomposition and metabolism.

PHAR 712. Pharmaceutical Care Lab 2. 2 Hours.

PR: First professional year standing or consent. Continuation of PHAR 701.

PHAR 715. Pharmacotherapeutics 1. 4 Hours.

PR: Second professional year standing or consent. Principles and concepts of pathophysiology and pharmacotherapeutics. An organ system approach to disease states and their therapeutic management is followed.

PHAR 716. Chemistry of Drug Action 1. 3 Hours.

PR: PHAR 711 or consent. Provides a basic understanding of relationships between the chemical structure of a drug and its biological effect. Physicochemical properties, enzymatic transformations and structure-activity relationships (SAR) of important pharmaceutical agents are discussed.

PHAR 717. Pharmacy Practice Experience 3. 1 Hour.

PR: Second professional year standing or consent. Introduces students to the principles of service learning through development of an on-site healthcare-related service project. Third course of a six-semester sequence that introduces students to various pharmacy practice settings.

PHAR 718. Pediatric Pharmacotherapy. 2 Hours.

PR: Second professional year standing or consent. Overview of common pathophysiology and pharmacotherapy principles in the pediatric population and selection of drug therapy to treat the pediatric patient.

PHAR 719. Pharmacy Practice Experience 4. 1 Hour.

PR: PHAR 717 or consent. Introduces students to the principles of service learning through implementation of an on-site healthcare related service project. Fourth course of a six-semester sequence that introduces students to various pharmacy practice settings.

PHAR 720. Patient Health Education. 2 Hours.

PR: Second professional year standing or consent. Interpersonal communication skills will be enhanced in the areas of patient-centered and colleague-centered communications. Students will learn processes for providing pharmaceutical care (e.g., interviewing and counseling patients; formulating a plan; monitoring; and documenting information).

PHAR 721. Advocacy and Leadership. 2 Hours.

PR: Second and third professional year standing or consent. The course will focus on developing the student's leadership skills as an advocate for the profession of pharmacy.

PHAR 722. Weapons of Mass Destruction and Disaster Planning. 1 Hour.

Through didactic, hands on instruction, and participation in real world disaster planning sessions and/or drills, students learn about weapons of mass destruct (WMD) surveillance and mitigation in addition to disaster planning principles.

PHAR 723. Pharmaceutical Care Lab 3. 1 Hour.

PR: Second professional year standing or consent. Continuation of PHAR 712.

PHAR 724. Pharmaceutical Care Lab 4. 2 Hours.

PR: Second professional year standing or consent. Continuation of PHAR 723.

PHAR 725. Pharmacotherapeutics 2. 4 Hours.

PR: PHAR 715 or consent. A continuation of PHAR 715.

PHAR 726. Chemistry of Drug Action 2. 2 Hours.

PR: PHAR 716 or consent. A continuation of PHAR 716.

PHAR 727. Medical Literature Evaluation. 2 Hours.

PR: Second professional year standing or consent. Emphasis is placed on the critical analysis and evaluation of the primary literature. Secondary and computerized information resources are also discussed, including other selected aspects of drug information.

PHAR 728. Pharmacy Management. 2 Hours.

PR: Second professional year standing or consent. This course provides an introductory survey of the basic principles of personnel and fiscal management as they apply to organizational planning and decision-making, organizational design and structure, leadership and control in organizations, and the issues facing pharmacy managers.

PHAR 730. Pharmacotherapeutics 3. 4 Hours.

PR: PHAR 725 or consent. A continuation of PHAR 725.

PHAR 731. Pharmacogenomics and Pharmacokinetics. 3 Hours.

PR: Third year professional standing or consent. Fundamental principles of pharmacogenomics (how genetic influences affect drug dosing and efficacy) and pharmacokinetics (pharmacokinetic and biological processes a drug undergoes upon entering the body).

PHAR 732. Non-Prescription Drugs. 3 Hours.

PR: Third year professional standing or consent. An advanced level course on the appropriate selection, and use of non-prescription drug products in the contemporary practice setting, the basis for self-medication, assessment of patient condition, and approach to patient counseling.

PHAR 733. Pharmacy Systems. 2 Hours.

PR: Third year professional standing or consent. Basic principles of financial management as they apply to the day-to-day operations in pharmacy systems present in institutional, community, long-term care facilities and other pharmacy venues.

PHAR 735. Pharmaceutical Care Lab 5. 1 Hour.

PR: PHAR 724. Continuation of PHAR 724.

PHAR 736. Pharmaceutical Care Lab 6. 1 Hour.

PR: Third Year Professional standing or consent. Experience in pharmaceutical compounding, patient assessment and monitoring, professional/ethical decision making, pharmacokinetic dosing of medications, and prevention of adverse drug-related events and medication errors.

PHAR 737. Disease Prevention Health Promotion. 2 Hours.

PR: Third year professional standing or consent. This course exposes pharmacy students to pharmacoepidemiology and public health. Instruction focuses on pharmacists as integral to preventing and detecting disease and promoting community health. Emphasis is given to rural health care and Appalachian culture.

PHAR 738. Outcomes Assessment and Quality Improvement. 2 Hours.

PR: Third professional year standing or consent. Outcomes assessment and quality improvement will expose students to the development and implementation of formularies, drug use evaluations, outcomes assessment, and quality improvement. Emphasis will be placed on how these issues relate to pharmaceutical services.

PHAR 739. Therapeutic Patient Monitoring. 2 Hours.

PR: Third professional year standing or consent. Employs both didactic and experiential instruction to provide students with the knowledge and skills required to care for patients with diabetes, perform immunizations, and care for complex patients with multiple disease states.

PHAR 740. Pharmacotherapeutics 4. 4 Hours.

PR: PHAR 730 or consent. A continuation of PHAR 730.

PHAR 741. Clinical Pharmacokinetics. 3 Hours.

PR: PHAR 731 or consent. This course will review advanced concepts in pharmacokinetics and cover the basic pharmacokinetic properties of commonly used drugs and apply these principles to drug dosing, patient management, and rational therapeutic drug monitoring.

PHAR 742. Pharmacy Practice Experience 5. 1 Hour.

PR: Third professional year standing or consent. Provides experiential learning in an acute or ambulatory care pharmacy practice setting. Fifth course in a six-semester sequence that introduces students to various pharmacy practice settings.

PHAR 743. Teach to Learn: Learn to Teach. 2 Hours.

Provides pharmacy students the opportunity to learn how to teach in higher education/pharmacy and develop their teaching skills by participating in select teaching and learning activities.

PHAR 744. Education Journal Club. 1 Hour.

PR: PHAR 743 or Consent. Evaluate educational research articles from pharmacy education and other healthcare disciplines. Students will present and critically analyze educational literature and develop presentation skills.

PHAR 745. Critical Care Pharmacotherapy. 2 Hours.

PR: Third professional year standing or consent. Gain knowledge in multiple facets of critical care pharmacotherapy, particularly for students interested in pharmacy residency training in a clinical setting.

PHAR 746. Pharmacy Practice Experience 6. 1 Hour.

PR: PHAR 742 or consent. Provides experiential learning in an acute or ambulatory care pharmacy practice setting. Sixth course in a six-semester sequence that introduces students to various pharmacy practice settings.

PHAR 747. History of Pharmacy. 2 Hours.

Gives the student a deeper appreciation of the background of pharmacy and its development from ancient times to present.

PHAR 748. Acute Care Case Studies. 2 Hours.

PR: Third professional year standing or consent. Gain experience developing pharmaceutical care plans in an acute care setting. Further prepares students interested in pursuing pharmacy residency training.

PHAR 749A. Pharmaceutical Investigation. 2-3 Hours.

PR: Consent. Original investigation in pharmaceutics, medicinal chemistry, pharmacology, pharmaceutical systems and policy, or clinical pharmacy. (Grading may be P/F.).

PHAR 749B. Pharmaceutical Investigation. 2-3 Hours.

PR: Consent. Original investigation in pharmaceutics, medicinal chemistry, pharmacology, pharmaceutical systems and policy or clinical pharmacy. (Grading may be P/F.).

PHAR 749C. Pharmaceutical Investigation. 2-3 Hours.

PR: Consent. Original investigation in pharmaceutics, medicinal chemistry, pharmacology, pharmaceutical systems and policy or clinical pharmacy. (Grading may be P/F.).

PHAR 749D. Pharmaceutical Investigation. 2-3 Hours.

PR: Consent. Original investigation in pharmaceutics, medicinal chemistry, pharmacology, pharmaceutical systems and policy or clinical pharmacy. (Grading may be P/F.).

PHAR 749E. Pharmaceutical Investigation. 2-3 Hours.

PR: Consent. Original investigation in pharmaceutics, medicinal chemistry, pharmacology, pharmaceutical systems, and policy, or clinical pharmacy. (Grading may be S/U.).

PHAR 749F. Pharmaceutical Investigation. 2-3 Hours.

PR: Consent. Original investigation in pharmaceutics, medicinal chemistry, pharmacology, pharmaceutical systems and policy, or clinical pharmacy. (Grading may be P/F.).

PHAR 749G. Pharmaceutical Investigation. 2-3 Hours.

PHAR 749G. Pharmaceutical Investigation. 2-3 Hr, PR: Consent. Original Investigation in pharmaceutics, medicinal chemistry, pharmacology, pharmaceutical systems and policy, or clinical pharmacy. (Grading may be P/F.).

PHAR 749H. Pharmaceutical Investigation. 2-3 Hours.

PR: Consent. Original investigation in pharmaceutics, medicinal chemistry, pharmacology, pharmaceutical systems and policy, or clinical pharmacy. (Grading may be P/F.).

PHAR 749I. Pharmaceutical Investigation. 2-3 Hours.

PR: Consent. Original investigation in pharmaceutics, medicinal chemistry, pharmacology, pharmaceutical systems and policy, or clinical pharmacy. (Grading may be P/F.).

PHAR 749J. Pharmaceutical Investigation. 2-3 Hours.

PR: Consent. Original investigation in pharmaceutics, medicinal chemistry, pharmacology, pharmaceutical systems and policy, or clinical pharmacy. (Grading may be P/F.).

PHAR 749K. Pharmaceutical Investigation. 2-3 Hours.

PR: Consent. Original investigation in pharmaceutics, medicinal chemistry, pharmacology, pharmaceutical systems and policy, or clinical pharmacy. (Grading may be P/F.).

PHAR 749L. Pharmaceutical Pharmacy. 2-3 Hours.

PR: Consent. Original investigation in pharmaceutics, medicinal chemistry, pharmacology, pharmaceutical systems and policy, or clinical pharmacy. (Grading may be P/F.).

PHAR 749M. Pharmaceutical Investigation. 2-3 Hours.

PR: Consent. Original investigation in pharmaceuticals, medicinal chemistry, pharmacology, pharmaceutical systems and policy, or clinical pharmacy. (Grading may be P/F.).

PHAR 749N. Pharmaceutical Investigation. 2-3 Hours.

PR: Consent. Original investigation in pharmaceuticals, medicinal chemistry, pharmacology, pharmaceutical systems and policy, or clinical pharmacy. (Grading may be P/F.).

PHAR 749O. Pharmaceutical Investigation. 2-3 Hours.

PR: Consent. Original investigation in pharmaceuticals, medicinal chemistry, pharmacology, pharmaceutical systems and policy, or clinical pharmacy. (Grading may be P/F.).

PHAR 749P. Pharmaceutical Investigation. 2-3 Hours.

PR: Consent. Original investigation in pharmaceuticals, medicinal chemistry, pharmacology, pharmaceutical systems and policy, or clinical pharmacy. (Grading may be P/F.).

PHAR 749Q. Pharmaceutical Investigation. 2-3 Hours.

PR: Consent. Original investigation in pharmaceuticals, medicinal chemistry, pharmacology, pharmaceutical systems and policy, or clinical pharmacy. (Grading may be P/F.).

PHAR 749R. Pharmaceutical Investigation. 2-3 Hours.

PR: Consent. Original investigation in pharmaceuticals, medicinal chemistry, pharmacology, pharmaceutical systems and policy, or clinical pharmacy. (Grading may be P/F.).

PHAR 749S. Pharmaceutical Investigation. 2-3 Hours.

PR: Consent. Original investigation in pharmaceuticals, medicinal chemistry, pharmacology, pharmaceutical systems and policy, or clinical pharmacy. (Grading may be P/F.).

PHAR 749T. Pharmaceutical Investigation. 2-3 Hours.

PR: Consent. Original investigation in pharmaceuticals, medicinal chemistry, pharmacology, pharmaceutical systems and policy, or clinical pharmacy. (Grading may be P/F.).

PHAR 749U. Pharmaceutical Investigation. 2-3 Hours.

PR: Consent. Original investigation in pharmaceuticals, medicinal chemistry, pharmacology, pharmaceutical systems and policy, or clinical pharmacy. (Grading may be P/F.).

PHAR 749V. Pharmaceutical Investigation. 2-3 Hours.

PR: Consent. Original investigation in pharmaceuticals, medicinal chemistry, pharmacology, pharmaceutical systems and policy, or clinical pharmacy. (Grading may be P/F.).

PHAR 749W. Pharmaceutical Investigation. 2-3 Hours.

PR: Consent. Original investigation in pharmaceuticals, medicinal chemistry, pharmacology, pharmaceutical systems and policy, or clinical pharmacy. (Grading may be P/F.).

PHAR 749X. Pharmaceutical Investigation. 2-3 Hours.

PR: Consent. Original investigation in pharmaceuticals, medicinal chemistry, pharmacology, pharmaceutical systems and policy, or clinical pharmacy. (Grading may be P/F.).

PHAR 749Y. Pharmaceutical Investigation. 2-3 Hours.

PR: Consent. Original investigation in pharmaceuticals, medicinal chemistry, pharmacology, pharmaceutical systems and policy, or clinical pharmacy. (Grading may be P/F.).

PHAR 749Z. Pharmaceutical Investigation. 2-3 Hours.

PR: Consent. Original investigation in pharmaceuticals, medicinal chemistry, pharmacology, pharmaceutical systems and policy, or clinical pharmacy. (Grading may be P/F.).

PHAR 750. Automation and Technology. 2 Hours.

PR: Second year professional standing or consent. Provides an understanding of the newest technology that is available to a pharmacist in a retail or institutional setting. Students will learn to use PowerPoint, and gain experience making presentations and public speaking.

PHAR 751. Geriatrics. 2 Hours.

PR: Second or third year pharmacy students. A review of common pharmacotherapeutic and social issues of importance to older adult patients.

PHAR 752. History of Drug Discovery. 2 Hours.

This course is concerned with the way in which advances in chemistry and biochemistry have influenced advances in drug discovery and therapeutics beginning with the late 18th century through today.

PHAR 753. Social and Behavioral Theory and Health Outcomes Research. 3 Hours.

Basic social and behavioral theories related to the health behavior change and health outcomes. Open to graduate students in pharmacy, public health, or other health care fields.

PHAR 754. Decision Analysis in Healthcare. 3 Hours.

Core skills in clinical decision analysis which builds on concepts derived from epidemiology, biostatistics, computing, economics and operations research and applies them to medical and pharmacological decisions.

PHAR 755. Pharmacoeconomics. 3 Hours.

This graduate-level course is intended to train graduate students in evaluating and conducting pharmacoeconomic research.

PHAR 756. Health Survey Research Methods. 3 Hours.

This course seeks to increase students' understanding of survey research methods and to develop basic skills in survey development and administration.

PHAR 757. Patient Reported Outcomes. 3 Hours.

Provides a foundation in health outcomes research with an emphasis on patient reported outcomes in health service research.

PHAR 758. Ethical and Regulatory Aspects of Clinical Research. 2 Hours.

Provides overview of ethical and regulatory aspects of clinical research.

PHAR 759. Clinical and Population Practicum. 1 Hour.

Expose students to a population of interest in preparation for a research project. This course will help students to understand the lived experience of the population of interest and expose students to aspects of the healthcare system. Students will either work with a clinical population or community-based population to address one or more disease states. Grading will be Pass/Fail.

PHAR 760. Acute Care Rotation 1. 5 Hours.

PR: Fourth year professional standing or consent. Five-week experience in the delivery of pharmaceutical care in an acute care setting.

PHAR 761. Acute Care Rotation 2. 5 Hours.

PR: Fourth year professional standing or consent. Experience in the delivery of pharmaceutical care in an acute care setting.

PHAR 762. Ambulatory Care Rotation 1. 5 Hours.

PR: Fourth year professional standing or consent. Experience in the delivery of pharmaceutical care in an ambulatory care setting.

PHAR 763. Ambulatory Care Rotation 2. 5 Hours.

PR: Fourth year professional standing or consent. Five-week experience in the delivery of pharmaceutical care in an ambulatory care setting.

PHAR 764. Elective Rotation 1. 5 Hours.

PR: Fourth year professional standing or consent. Five-week experience in a pharmacy practice setting, such as acute care, ambulatory, community, hospital, poison center, drug information, home health, long term care, or research.

PHAR 765. Elective Rotation 2. 5 Hours.

PR: Fourth year professional standing or consent. Five-week experience in a pharmacy practice setting, such as acute care, ambulatory, community, hospital, poison center, drug information, home health, long term care, or research.

PHAR 766. Selective Rotations. 5 Hours.

PR: Fourth year professional standing or consent. Five-week experience in a pharmacy practice setting, selected from a list and includes: pharmacy administration, discharge counseling, drug information, informatics, long term care, managed care, medication reconciliation, medication safety, nuclear pharmacy, clinical toxicology, and quality outcomes.

PHAR 768. HEOR/HSOR Internship. 1-6 Hours.

Strengthen practical knowledge and hands-on experience in the areas of Health Services and Outcomes Research/Health Economics and Outcomes Research by working with pharmaceutical companies, clinical research organizations, federal, state, and local governments, policy think tanks, or health care systems.

PHAR 769. Advanced Health Service Research Methods. 3 Hours.

Provides a working knowledge of health services research methods and how to apply these methods to answer typical research questions in health services research. The course will examine concepts but will have an applied focus with hands-on research using publicly available datasets or those that students have access for their dissertations/manuscripts.

PHAR 770. Community Rotation. 5 Hours.

PR: Fourth year professional standing or consent. Five-week experience in the delivery of pharmaceutical care in a community pharmacy setting.

PHAR 772. Institutional Rotation. 5 Hours.

PR: Fourth year professional standing or consent. Five-week experience in the delivery of pharmaceutical care in a health system setting.

PHAR 774. Current Topics in Pharmacy. 1 Hour.

Discussion of current topics in pharmacy practice. Core components of giving a seminar and journal club will be practiced.

PHAR 775. Advanced Biopharmaceutics. 3 Hours.

Concepts of biopharmaceutics and pharmacokinetics in relation to the design and evaluation of dosage forms and determination of rational dosage regimens in health and disease.

PHAR 776. Preparing Residency Applicants. 2 Hours.

Increase knowledge and skills needed to pursue postgraduate residency training in pharmacy, and implement measures to increase pharmacy residency competitiveness.

PHAR 777. Health Outcomes Research Designs. 2 Hours.

Focuses on the skills required to design, conduct, and analyze research topics in health outcomes research. Includes a study of statistics, analysis of research design and methodology, use of library resources, and evaluation of current literature.

PHAR 778. Travel Medicine and Global Pharmacy Practice. 2 Hours.

Identifies and explores major issues in global health with a specific focus on global pharmacy practice and medication therapy. Students will also learn fundamentals in travel medicine so they can assist international travelers in preventing and treating travel-related maladies.

PHAR 779. Drugs: Bench to Market. 3 Hours.

PR: Graduate standing PR: Graduate Standing or permission of instructor. This is an introductory course that describes the process of drug discovery to the development of new forms for therapeutic use. Topics covered include drug design/discovery, pharmacokinetics and dynamics, pharmaceuticals and industry pharmacy.

PHAR 780. Introduction to Molecular Modeling. 4 Hours.

PR: Graduate standing or permission of instructor. Introduction to molecular modeling describes computational methods for chemical and biological problems and is designed to enable the student to use molecular modeling methods as a research tool in their current or future research activities.

PHAR 781. Drug Metabolism. 3 Hours.

PR: Graduate standing or permission of instructor. This course presents a comprehensive review of the field of drug metabolism with an emphasis on the chemistry and enzymology of drug biotransformation, and current methods in drug metabolism research.

PHAR 782. Tumors of the Central Nervous System Journal Club. 1 Hour.

(May be repeated for a maximum of 15 credit hours.) Fundamental and advanced topics focused on drug distribution into normal brain, brain pathology and brain cancers. Other areas of focus include, advanced drug delivery methods, pharmacokinetics, experimental design and statistical analysis. Students will present and critically analyze scientific literature and develop presentation skills.

PHAR 783. Pharmacy Cell Biology Seminar. 1 Hour.

A literature review course in which each student will present and critically analyze primary literature in cell and molecular biology as pertinent to pharmaceutical and biomedical sciences.

PHAR 784. Pharmacology Journal Club. 1 Hour.

A primary literature based course that critically evaluates the latest findings and methods used in pharmacological research.

PHAR 785. Pharmacoepidemiology. 3 Hours.

This course covers basic principles and research study designs used in pharmacoepidemiology, as well as a review of the primary literature that details case examples of drugs withdrawn from the US drug market.

PHAR 786. Health Services Research and Secondary Database. 3 Hours.

PR: PHAR 785. This course presents various topics related to large databases including common study designs, advantages and limitations, and basic steps to extracting and analyzing large databases.

PHAR 787. Drug Discovery and Development. 1 Hour.

This seminar will teach students in the Pharmaceutical Sciences and related disciplines the current state-of-the-art of drug discovery, design, and development, develop student presentation skills, and convey the importance of staying current with key developments.

PHAR 788. Graduate Seminar in Health Outcomes Research. 1 Hour.

(May be repeated for credit toward graduation.) Forum for graduate students to present research, discuss research issues and contemporary topics of interest, develop an understanding of research methods through discussion, while focusing on scientific presentation skills. Topics vary from semester to semester.

PHAR 789. Seminar in Nanoscience. 2 Hours.

(May be repeated for a maximum of 4 hours.) Facilitates interdisciplinary research at the nanoscale by providing a forum for discussion and exploration of nanoscale science and engineering from a variety of perspectives including research and development of nanoscale devices and systems. Grading will be Pass/Fail.

PHAR 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of pharmacy. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be P/F.).

PHAR 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

PHAR 792A-H. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

PHAR 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

PHAR 794A-Z. Seminar. 1-6 Hours.

Seminars arranged for advanced graduate students.

PHAR 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

PHAR 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

PHAR 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

PHAR 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

PHAR 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

PHAR 800. Pharmacy Practice and Management 1. 4 Hours.

Introduces student to the practice of pharmacy, with a focus on community pharmacy. PPM 1 is the first course in a five-course sequence (PPM 1-5) that introduces and reinforces the distributive, clinical, and administrative roles of pharmacists in various practice settings.

PHAR 801. Drug Delivery. 5 Hours.

An introduction to the concepts and techniques involved in the design and evaluation of pharmaceutical dosage forms, principles of physical pharmacy and drug delivery, and their applications in patient care.

PHAR 802. Preparation of Pharmaceutical Products. 2 Hours.

Gain experience in pharmaceutical calculations and preparing sterile and non-sterile dosage forms. Students will apply the principles of pharmaceuticals to the preparation of pharmaceutical products.

PHAR 810. Pharmacy Practice and Management 2. 4 Hours.

PR: First professional year standing or consent. The second course in a five-course sequence (PPM 1-5). Introduces and reinforces the distributive, clinical, and administrative roles of pharmacists in various practice settings, with a focus on community pharmacy practice.

PHAR 811. Foundational Pharmacy Skills. 1 Hour.

PR: First professional year standing or consent. Provide students with foundational skills necessary for the provision of patient care including physical assessment, point of care testing, and oral and written communication. Many skills learned during this course will be further strengthened throughout pharmacy school.

PHAR 812. Drug Chemistry and Biotechnology. 3 Hours.

PR: First year professional standing or consent. Introduces principles of chemical stability and chemical properties as they relate to drugs and to the basic metabolic processes observed for drug molecules. Biotechnology will focus on pharmaceutical applications of cell and molecular biotechnology.

PHAR 813. Biopharmaceutics and Pharmacogenomics. 4 Hours.

PR: First professional year standing or consent. Develops an understanding of fundamental principles of biopharmaceutics and pharmacogenomics.

PHAR 814. Biochemical Pharmacology. 4 Hours.

PR: First professional year standing or consent. Provides a basis for understanding the biochemical and molecular mechanisms by which drugs and the body interact. This course will use drug classes to introduce foundational concepts of drug action and the application of pharmacological tools to better understand how drugs work in the body.

PHAR 815. Self-Care. 3 Hours.

PR: First professional year standing or consent. Provides an introduction to nonprescription medications and the application to patient care. Learners will assess the patient, make appropriate recommendations, and educate the patient on self-care treatment options for commonly encountered disease states and patient complaints.

PHAR 818. Intro Community Rotation. 1,3 Hour.

PR: PHAR 800 or PR or CONC: PHAR 810. Introductory pharmacy practice experience in a community pharmacy setting.

PHAR 820. Pharmacy Practice and Management 3. 3 Hours.

PR: Second professional year standing or consent. The third course in a five-course sequence (PPM 1-5). Introduces the role of the pharmacist in public health initiatives, pharmacoepidemiology, and enhancing quality in the healthcare system.

PHAR 822. Service Learning Practice Experience 1. 1 Hour.

PR: Second professional year standing or consent. The first course in a 2-semester series that introduces students to the basic principles of service learning through on-site healthcare-related service projects. Interprofessional education is a component of the course.

PHAR 823. Pulmonology. 3 Hours.

PR: Second professional year standing or consent. First course in the systems-based therapy series with a focus on pulmonology. Integrates scientific principles with clinical practice to enable students to prevent, identify, and resolve drug therapy problems in patients with pulmonary diseases.

PHAR 824. Cardiology. 5 Hours.

PR: Second professional year standing or consent. Second course in the systems-based therapy series with a focus on cardiology. Integrates scientific principles with clinical practice to enable students to prevent, identify, and resolve drug therapy problems in patients with cardiovascular diseases.

PHAR 825. Nephrology. 2 Hours.

PR: Second professional year standing or consent. Third course in the systems-based therapy series with a focus on nephrology. Integrates scientific principles with clinical practice to enable students to prevent, identify, and resolve drug therapy problems in patients with kidney diseases.

PHAR 826. Evidence-Based Practice. 3 Hours.

PR: Second professional year standing or consent. The components of evidence-based practice are reviewed. Emphasis is placed on the appropriate use of information resources in practice and the critical analysis and evaluation of primary literature and other types of information.

PHAR 830. Pharmacy Practice and Management 4. 3 Hours.

The fourth course in a five-course sequence (PPM 1-5). Introduces and reinforces the distributive, clinical, and administrative roles of pharmacists with a focus on health-systems pharmacy practice and highlights the pharmacist's role in financial management, pharmacoeconomics, and patient reported outcomes.

PHAR 832. Service Learning Practice Experience 2. 1 Hour.

PR: PHAR 822. The second course in a 2-semester series that introduces students to the basic principles of service learning through on-site healthcare-related service projects.

PHAR 833. Endocrinology. 3 Hours.

Fourth course in the systems-based therapy series with a focus on endocrinology. Integrates scientific principles with clinical practice to enable students to prevent, identify, and resolve drug therapy problems in patients with endocrine diseases.

PHAR 834. Immunology. 3 Hours.

Fifth course in the systems-based therapy series with a focus on immunology. Integrates scientific principles with clinical practice to enable students to prevent, identify, and resolve drug therapy problems in patients with immunological diseases and hypersensitivities.

PHAR 835. Rheumatology and Pain. 2 Hours.

Sixth course in the systems-based therapy series with a focus on management of rheumatologic disorders and pain. Integrates scientific principles with clinical practice to enable students to prevent, identify, and resolve drug therapy problems in patients with these diseases.

PHAR 836. Research in the Pharmaceutical Sciences. 3 Hours.

An overview of the process of conducting health-related research focusing on concepts, principles and methodology involved with the research process. Students gain experience in research proposal development and practice writing skills. Student learning is facilitated by didactic lectures, active learning and independent small group sessions.

PHAR 838. Intro Institutional Rotation. 1 Hour.

PR or CONC: PHAR 830. Gain experience in an institutional pharmacy setting.

PHAR 840. Pharmacy Practice and Management 5. 3 Hours.

The fifth course in a five-course sequence (PPM 1-5). This course focuses on pharmacy management related to financial and operational management of pharmacies, marketing of pharmacy services, health and pharmacy policy and advocacy, and human resources management.

PHAR 843. Gastroenterology and Nutrition. 3 Hours.

Seventh course in the systems-based therapy series with a focus on gastroenterology and nutrition. Integrates scientific principles with clinical practice to enable students to prevent, identify, and resolve drug therapy problems in patients with gastrointestinal diseases and nutrition support.

PHAR 844. Infectious Diseases. 3 Hours.

Eighth course in the systems-based therapy series with a focus on infectious diseases. Integrates scientific principles with clinical practice to enable students to prevent, identify, and resolve drug therapy problems in patients with infectious diseases.

PHAR 845. Neurology and Psychiatry. 4 Hours.

Ninth course in the systems-based therapy sequence with a focus on neurology and psychiatry. Integrates scientific principles with clinical practice to enable students to prevent, identify, and resolve drug therapy problems in patients with neurologic and psychiatric diseases.

PHAR 848. Acute Care Practice Experience. 2 Hours.

Gain knowledge as well as hands-on experience in the acute care setting. Students will learn the key components of acute care practice, perform activities that would be expected to be completed in acute care experiential rotations (such as medication reconciliation and formulary monographs), and simulate rounding experiences in an interprofessional environment. Interprofessional education is a component of this course.

PHAR 849. Ambulatory Care Practice Experience. 2 Hours.

Gain knowledge as well as hands-on experience in the ambulatory care setting. Activities will include ambulatory patient assessment, medication regimen evaluation, patient presentations, direct patient education, and targeted group education. Interprofessional education is a component of this course.

PHAR 853. Hematology/Oncology. 4 Hours.

Tenth course in the systems-based therapy series with a focus on hematology-oncology. Integrates scientific principles with clinical practice to enable students to prevent, identify, and resolve drug therapy problems in patients with hematological diseases and cancer.

PHAR 854. Special Populations. 3 Hours.

The final course in the systems-based therapy series that addresses special populations such as geriatrics, pediatrics and women's health (pregnancy, lactation, menopause) as well as disease processes that involve multiple body systems. Integrates scientific principles with clinical practice to enable students to prevent, identify, and resolve drug therapy problems.

PHAR 858. Comprehensive Assessment of Practice. 3 Hours.

Assess students' readiness for successful completion of the upcoming advanced pharmacy practice experiences curriculum. Provides focused reinforcement of essential material relative to ensuring a student is practice ready, as well as reviewing difficult material from throughout the curriculum. Students complete a final objective structured clinical examination, which requires the demonstration of specific skills, including communication.

PHAR 859. Pharmacy Law and Ethics. 3 Hours.

PR: Third professional year standing or consent. The legal and ethical basis of pharmacy practice. Students learn about federal and state statutes, rules, and regulations that affect pharmacy practice. Ethics related situations that can arise during pharmacy practice will also be discussed.