PharmD Curriculum Guide
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The Eshleman Advantage

In May 2019, the School graduated the inaugural class of students in our new, transformative Doctor of Pharmacy curriculum. With the new curriculum, students learn fundamental concepts outside of class, and are challenged to apply and extend those concepts in the classroom. Immersion in patient care in the experiential setting begins immediately after the first year and occurs continually through years two, three, and the entire fourth year.

Fast Facts

- US News and World Report No. 1 ranked school of pharmacy in the U.S.
- 2,400 average immersion hours for each PharmD graduate
- 75% PharmD graduates complete post graduate training
- No. 1 residency match rate in 2019
Overview
We are committed to offering you the best pharmacy education in the world. We’ll work tirelessly to help you cultivate and reach your full potential. We will prepare you to be a leader and innovator who recognizes the health-care needs of patients and society and who leads teams toward improvement and change for the betterment of patient care.

Our curriculum is engaging, relevant, and contemporary. You will study foundational science intensely for one year. You will learn in the context of mentored direct patient care beginning immediately after year one and continue to be immersed in pharmacy practice for up to fifteen months.

In class, your professors will challenge you to think critically and to solve problems by actively applying important concepts. This in-class active learning is possible because you’ll have already gained the knowledge you need through self-directed learning outside the classroom.

You will be immersed in patient care early and continually in your education as a member of an interdisciplinary health-care team. You will pursue scientific inquiry and learn to create innovative solutions to real-world health-care problems.

Change Is Here
Health care is evolving rapidly. Pharmacists must grow and change with it. A successful practitioner will be able to do the following:

- Participate as an integral member of the health-care team
- Evaluate and create new opportunities to improve patient care and care delivery
- Act responsibly, ethically, and professionally at all times
- Shape policy and lead change in the profession and in health care

It’s impossible for us to teach you everything you’ll ever need to know. And we embrace that fact.

What we will do is ensure that you develop a deep understanding of the foundations of the pharmaceutical sciences, pharmacy practice, and patient care.

And we’ll do much more.

The Much More
Our curriculum maximizes interaction between student and professor. Our faculty will inspire you and foster in you a collection of skills and habits that will set you apart as a scholarly and inquisitive practitioner.

Ultimately, it’s this combination of inspiration and education that will transform you into an innovative leader who recognizes the health care needs of patients and leads change to improve patient care.
Curriculum at a Glance

Year One: Foundations of Pharmacy
- Introduces you to the foundational pharmaceutical sciences, which are the building blocks of pharmacy
- Gives you the solid foundation you’ll need to start working with patients and health-care professionals

Years Two and Three: Immersion in Patient Care and Engagement in Clinical Decision Making
- Early experiences in the real-world practice of pharmacy followed by reflection and discussion
- Small-group and large-classroom experiences to further learning, professional development, and career-path exploration
- Immersion begins the summer after the first year.

Year Four: Advanced and Elective Pharmacy Practice Experiences
- Numerous advanced patient care and elective rotations
- Opportunities for you to mature your approach to pharmacy practice and to define your career path

Students have the option to select specialized areas of learning in Research and Scholarship (RASP), Rural Healthcare, and Global Pharmacy (GPS).

Pharm.D. Program Accreditation
The doctor of pharmacy program at the UNC Eshelman School of Pharmacy was reaccredited in January 2012 by the Accreditation Council for Pharmacy Education.

The accreditation term granted for the doctor of pharmacy program extends until June 30, 2020, which represents the customary eight-year cycle between self-studies.

The professional program of the School and its accreditation status is designated on ACPE’s web site, acpe-accredit.org.
Year One: Foundations of Pharmacy
• Introduces you to the foundational pharmaceutical sciences, which are the building blocks of pharmacy
• Gives you the solid foundation you’ll need to start working with patients and health-care professionals
• Immersion begins the summer after the first year.

During your first year, you will focus on the foundations of pharmacy and pharmaceutical sciences through an active-learning approach that centers on you. Our goal is to expose you to the underlying fundamentals and give you the chance to apply what you are learning, to solve complex problems, to think deeply and critically, and to develop the skills necessary to be a self-directed, lifelong learner.

A Fast Start with Familiar Favorites
We won’t ask you to spend months revisiting prerequisite course work you’ve already completed. Instead you start with our unique Pharmacy Bridging Course that involves six modules in the first month:
• Organic chemistry
• Biochemistry
• Physiology
• Biostatistics
• Pharmacy Toolkit

During the Pharmacy Bridging Course, you review the basic subject matter while exploring its connection and application to pharmacy-specific problems.

Foundations of Pharmacy
You’ll be ready for the challenges of the active classroom thanks to online modules that deliver the information you need to you outside of class.

Next up are thirteen courses exploring the following subjects that provide the foundational knowledge for patient care:
• On Becoming a Pharmacist (fall)
• Pathophysiology of Human Disease (fall)
• Molecular Foundations of Drug Action (fall)
• Evidence-Based Practice (fall)
• Pharmacy Calculations (fall)
• Immunization Certificate program (fall)
• Pharmaceutics and Drug Delivery Systems (fall & spring)
• Pharmacokinetics (spring)
• Clinical Pharmacology (spring)
• Pharmaceutical Compounding (fall & spring)
• Pharmacotherapy: Foundations (spring)
• Self-care + Non-prescription Medications (spring)
• Foundations in Patient Care (spring)

These courses have been newly designed and built from the ground up with you in mind. Rather than focusing on discipline-specific minutia, we’ll be working to reinforce the notion that there’s a patient at the end of every lesson. By engaging in deep learning, you’ll work alongside our world-class faculty to prepare for patient-care experiences.

You’ll be ready for the challenges of the active classroom thanks to online modules and pre-class readings that deliver the information you need to you outside of class.

The factual content of the courses is thoughtfully packaged and available to you for self-directed learning outside of class. Class time is devoted to faculty-student interactions and higher forms of thinking and problem solving.
Professional Year 1 Fall Course Descriptions

PHCY 500 – Pharmacy Bridging Course (3.0 hours)

This course comprises six modules in the core science and math subjects: organic chemistry, biochemistry, physiology, biostatistics, Evidence Based Learning and Pharmacy Toolkit. The course supplements knowledge from students’ prepharmacy coursework and frames the material in the context of pharmacy and health-care applications.

PHCY 501 – On Becoming a Pharmacist (1.0 hour)

The course orients students to the vision, guiding principles and outcomes of the PharmD program, to the core competencies integral to student success and to pharmacy career opportunities and the real-world importance of the core competencies. Students explore how the principles of professionalism, leadership and innovation can transform pharmacy.

PHCY 502 – Pathophysiology of Human Disease (3.5 hours)

The course transitions from human physiology to a clinical understanding of select high-priority human disease states. The course explores processes whereby disease states develop and progress, and associated changes in tissues and organs. Contemporary biomedical science is integrated to establish a knowledge base for clinical pharmacology and pharmacotherapeutic approaches.

PHCY 503 – Molecular Foundations of Drug Action (3.5 hours)

The course explores the fundamental mechanisms of drug action, emphasizing the modulation of interactions between endogenous ligands and targets. Key target types include nucleic acids, enzymes, kinases, GPCRs, nuclear receptors, transporter proteins and ligand-gated ion channels. Key concepts include enzyme action, regulation, inhibition and signal transduction.

PHCY 504 – Evidence-Based Practice (3.0 hours)

The course teaches students to identify, critically evaluate, and interpret scientific literature to support the conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients. Skills developed include experimental design, identifying gaps in knowledge, asking relevant questions and drawing appropriate conclusions.

PHCY 508 – Pharmaceutical Calculations (1.0 hour)

The course develops skills in pharmaceutical calculations and problem solving necessary in contemporary pharmacy practice. Students work step-by-step through real-world pharmaceutical and clinical calculations and gain greater understanding of the fundamental principles and basic techniques involved in the application of calculations needed for successful pharmacy practice.
PHCY 509 – Immunization Certificate Training Program (0.5 hour)

The course is based on the APhA Pharmacy-Based Immunization Delivery Certificate Training Program. The practice-based curriculum combines science and clinical pharmacy to educate students about professional opportunities for vaccine advocacy and administration. The health-care team approach fosters implementation of interventions that promote disease prevention and public health.

PHCY 512 – Pharmaceutics & Drug Delivery Systems I (2.0 hours)

The study of pharmaceutics provides foundational knowledge to enable rational decision-making about drug therapy based on the principles of drug delivery systems. This course is Part I of a two-part course sequence and focuses on physicochemical properties of drugs, physiological barriers to drug transport, and manufacturing methods of nonsterile dosage forms.

PHCY 513L – Pharmaceutical Compounding I: Nonsterile (1.5)

PHCY 513L is an introduction to the science and practice of nonsterile compounding in the US. It covers the role of nonsterile compounding in community and hospital pharmacy, interrelationships between physical and chemical aspects of compounding, acceptable preparation techniques, as well as state and federal regulations and standards governing this practice.

Professional Year 1 Spring Course Descriptions

PHCY 510 – Foundations of Clinical Pharmacology (3.0 hours)

Prerequisite, PHCY 502. Foundational knowledge of organ system pharmacology and the impact a drug’s absorption, distribution, metabolism, and excretion (ADME) properties on its pharmacology. Systematic approach to solving common drug regimen problems by consideration of disease clinical features, acute and chronic effects of drug action on disease pathophysiology, and underlying clinical pharmacology issues.

Prerequisites: PHCY 502, PHCY 503, PHCY 504

PHCY 511 – Foundations of Pharmacokinetics (3.0 hours)

Primary biological processes that govern the fate of a drug after its administration, mathematical models of those processes, mechanisms by which disease, genetics, diet, and other medications influence those processes. Focus on concepts and appropriate use of quantitative tools to develop individualized drug dosage regimens and determine pharmacokinetic parameters.
**PHCY 514 – Pharmaceutics and Drug Delivery Systems II (1.5 Hours)**

Physicochemical principles and manufacturing methods of small-molecule and biological drugs. Development of delivery systems to achieve successful pharmacological or immunological outcome. Foundational knowledge to enable rational decision-making about drug therapy based on the principles of drug delivery systems.

Prerequisite: PHCY 512

**PHCY 515L – Pharmaceutical Compounding II: Sterile (0.5 Hours)**

An introduction to the science and practice of sterile compounding in the United States including the role of pharmacy sterile compounding in community and hospital pharmacy, interrelationships between the physical and chemical aspects of sterile compounding, acceptable techniques of preparing individual sterile prescriptions or medication orders, as well as state and federal regulations and standards governing this practice. The course will require students to prepare multiple sterile compounded preparations utilizing aseptic techniques.

**PHCY 516 – Foundations of Patient Care (2.0 hours)**

Foundational knowledge and skills in the principles and practice of pharmacy, emphasizing a consistent approach to a systematic patient care process for delivering patient-centered, team-based healthcare. Application of this process of care to seven common disease states.

Prerequisites: PHCY 502, PHCY 503, PHCY 504

**PHCY 519 – Self-Care and Non-Prescription Medications (1.5 hours)**

Prerequisite, PY1 standing. Pharmacists are often the first health care professional patients turn to when seeking guidance to treat common ailments. This course focuses on quickly and accurately assessing patients to determine candidacy for self-care therapy, including nonprescription selections. Establishing a process to triage patients regarding self-care management is emphasized.

Prerequisites: PHCY 502, PHCY 503, PHCY 504

**PHCY 529 – Pharmacotherapy: Foundations (3.0 hours)**

This course serves as a transition from foundational coursework to direct patient care and coordinates learning activities with concurrent term courses. Students will learn how to approach patient scenarios and formulate pharmacotherapy recommendations. In-class discussion involves the application of pharmacotherapy principles to patient cases.
Prerequisites: PHCY 502, PHCY 503, PHCY 504

**Summer PY1 Courses**

**PHCY 591—Immersion Experience: Community or PHCY 691 – Immersion Experience: Health System (8.0 credit hours)**

Immersion Experience 1 provides an opportunity for student pharmacists to develop foundational knowledge and skills in health system or community pharmacy practice and to apply a consistent approach to patient care and the medication use process. Prerequisite: Student pharmacists must complete all preceding required didactic and experiential coursework as outlined in the Pharm D curriculum.

**Year Two: Immersion in Patient Care and Engagement in Clinical Decision Making**

- Early experiences in the real-world practice of pharmacy followed by reflection and discussion
- Small-group and large-classroom experiences to further learning, professional development, and career-path exploration

**To Learn, One Must Do.**
There is a fundamental body of information you must learn, but you don’t have to learn all of it in the classroom. Deeper learning occurs when you retain information for a long time and when you can apply that information to new situations. The deepest learning is most likely to result from the things that you do. To take advantage of this, we are moving some classroom instruction out into the real world, where you spend a great deal of time involved in caring for patients and learning to function in complex systems as a member of an interdisciplinary health-care team.

Students begin working with patients immediately after their first year. Students have a total of six months of patient-care activities during the summer experience and the second and third years of the curriculum.

**Early Patient Care**
You will begin working with patients immediately after your first year. When you learn something new, we want you to be as close to the application of that knowledge as possible.
Throughout the summer following the PY1 year and second and third years, you will have a total of six months of patient-care activities alternating with School-based courses and activities.

We plan to complement your experiences with self-directed online learning tools addressing contemporary therapeutics. A key advantage of this approach is that you’ll be learning things in the classroom just in time to apply them in the real world.

**School-Based Activities**

Revised February 2021
Alternating with your patient-care immersion experiences, you will spend blocks of time back on campus. During these School-based blocks, you will engage in self-directed learning around clinical decision making in pharmacotherapy courses that integrate advanced clinical pharmacology and pharmacokinetics. We also set aside time for you to study emerging topics and take elective courses.

**Think About It**
Learning by doing is an incomplete proposition. What really enables you to learn is reflection. In other words, you have to do and then think about what you did.

Setting aside time to talk about what you’ve seen, done, and learned with professors, preceptors and peers is a crucial step in the learning process.

Our immersive, experiential learning opportunities are complemented by mentored reflection on patient care and health-system experiences. In addition to reflection, your time back on campus provides opportunities for other faculty-mentored activities, including the following:

- Integration and connection of foundational and pharmacotherapy knowledge to patient care
- Exposure to advanced concepts, emerging topics, and leadership and professional development
- Elective course work
- Individualized career-path exploration
PY 2 Course Overview

- September: Applied Clinical Pharmacology
- October: Patient Care Lab
- November: Pharmacotherapy: Applied
- December: The Patient Care Experience I
- January: The US Healthcare System
- Holiday Break
- February: Leadership & Professional Development I*
- March: Electives*
- April: Pharmacotherapy: Integrated I*
- May: Immersion Experience*: Community, Health System, or Direct Patient Care (Am Care or Inpatient)
- June: Elective Student Directed Practicum

* Schedule for one of two cohorts

Prepared by Office of Curricular Innovation, updated February 2019
Professional Year 2 Fall Course Descriptions

PHCY 601L – Patient Care Lab (1.5 credit hours)

Patient Care Lab builds on prerequisites to enable students to deliver patient-centered pharmaceutical care. Hands-on activities emphasize development of skills including evidence-based practice; drug information retrieval; patient education and counseling; and communication. Disease states and pharmacotherapy covered in concurrent courses will also be reinforced.

Prerequisites: PHCY 510, PHCY 516, PHCY 529

PHCY 609 – The US Healthcare System (2.0 credit hours)

This course provides historical background on our healthcare system, critically examines its current state, and compares it with others in the industrialized world. Legislative and regulatory elements driving healthcare evolution are mapped. Innovations and their implications for patients, providers, systems, and insurers are discussed.

PHCY 611 – Applied Clinical Pharmacology (3.0 credit hours)

Applied Clinical Pharmacology applies foundational elements of clinical pharmacology and problem-solving skills to individual patient and population-based clinical scenarios. Emphasis placed on dosing and monitoring pharmacotherapy regimens that maximize desired effects and minimize adverse effects to reinforce content covered in concurrent courses.

Prerequisites: PHCY 510, PHCY 516, PHCY 529

PHCY 617 – The Patient Care Experience (1.5 credit hours)

Students will appreciatively and critically analyze significant events encountered during their pharmacy practice experiences. Guided reflection and topic discussions will enhance student metacognition and the experience of patients. The process develops deeper learning by revealing new insights and perspectives as a professional practitioner, and informs clinical decision-making.

PHCY 630 – Pharmacotherapy: Applied (4.0 credit hours)

Foundations of Pharmacotherapy transitions students from foundational coursework to the patient-care setting. By integrating knowledge gained from prerequisite courses with principles of pharmacotherapy, students will be able to formulate pharmacotherapy recommendations for patient scenarios. Organ systems covered: immune, cardiovascular, respiratory, gastrointestinal, neurologic, endocrine and infectious disease.

Prerequisites: PHCY 510, PHCY 516, PHCY 529
**Professional Year 2 Spring Course Descriptions**

**PHCY 631 – Pharmacotherapy: Integrated I (5.0 credits)**

Integrated Pharmacotherapy I builds off of Foundations of Pharmacotherapy in which students will engage in pharmacotherapeutic decision making that integrates advanced clinical pharmacology and pharmacokinetics. Prerequisite: PHCY 630.

Prerequisites: PHCY 601L, PHCY 611, PHCY 630

**PHCY 636 – Leadership and Professional Development I (1.0 credit)**

Leadership and Professional Development focuses on leading self before leading others. This course will guide students through the development of a keen sense of self through self-awareness and self-reflection in order to begin developing the ‘leader within’ to lead with and through others. Prerequisite: PHCY 501.

Prerequisite: PHCY 501

**Immersion Experience 2 (8.0 credits)**

**PHCY 591—Immersion Experience: Community or PHCY 691 – Immersion Experience: Health System (8.0 credit hours)**

Immersion Experience 2 provides an opportunity for student pharmacists to develop foundational knowledge and skills in health system or community pharmacy practice and to apply a consistent approach to patient care and the medication use process. Prerequisite: Student pharmacists must complete all preceding required didactic and experiential coursework as outlined in the Pharm D curriculum.
Year Three: Continue Immersion in Patient Care and Engagement in Clinical Decision Making

- Early experiences in the real-world practice of pharmacy followed by reflection and discussion
- Small-group and large-classroom experiences to further learning, professional development, and career-path exploration

PY 3 Course Overview

* Schedule for one of two cohorts

Prepared by Office of Curriculum Innovation, updated February 2019
Professional Year 3 Fall Course Descriptions

**PHCY 732 – Pharmacotherapy: Integrated II (5.0 credits)**

Integrated Pharmacotherapy II is the second in a series of three case-based courses. It builds upon the clinical decision-making process and knowledge base introduced in PHCY 631, further developing students’ capacity to research, analyze and solve complex, patient medication problems in holistic, evidence-based ways.

Prerequisite: PHCY 631

**PHCY 737 – Leadership and Professional Development II (1.0 credit)**

Leadership and Professional Development II focuses on leaving a leadership legacy. Collaboration, teamwork, and the ability to exercise professionalism in crucial conversations are key to achieving success as a leader. Students will develop their leadership skills.

Prerequisite: PHCY 636

**PHCY 791 – Immersion Experience 3: Direct Patient Care (8.0 credits)**

Immersion Experience in Direct Patient Care is designed to build from foundational knowledge and skills gained during previous Immersion Experiences. This Immersion Experience will help students refine skills in applying a consistent approach to patient care, as exemplified in the Pharmacists' Patient Care Process. Patient care provided during this Immersion Experience could consider management of the entire patient (all identified medical conditions and medication-related problems) or could be focused to a single medical condition. IP/OP.

Prerequisite: Student pharmacists must complete all preceding required didactic and experiential coursework as outlined in the Pharm D curriculum
**Professional Year 3 Spring Course Descriptions**

**PHCY 718 – The Patient Care Experience II (2.0 credits)**

This course prepares students to fully engage in patient interactions in a wide variety of pharmacy practice settings. Emphasis is placed on pharmacy ethics and patients experiencing mental health crises. Through reflective activities, students identify strengths and opportunities for growth.

Prerequisite: PHCY 617

**PHCY 722 – Pharmacy Law: Regulation of Pharmacy Practice (3.0 credits)**

This course surveys the legal and regulatory frameworks that govern pharmacy practice. It begins with a review of the United States legal system. Next, it focuses on federal and state statutes and regulations. It concludes by examining common-law malpractice principles and their application to pharmacy practice.

**PHCY 733 – Integrated Pharmacotherapy III (5.0 credits)**

The last of a three case-based course sequence, PHCY 733 deepens the clinical decision-making process and knowledge base introduced in the preceding courses. Students will further develop their capacities to effectively and efficiently research, analyze and solve complex patient medication problems in a holistic, evidence-based, professional manner.

Prerequisite: PHCY 732
Year Four: Advanced and Elective Pharmacy Practice Experiences

- Numerous advanced patient-care and elective rotations
- Opportunities for you to mature your approach to pharmacy practice and to define your career path

Pharmacy Practice and Patient Care

Patient care comprises the entirety of the fourth year and allows you to refine your approach to pharmacy practice and to define your career path.

During the fourth year of the curriculum, you leave the classroom behind and immerse yourself in advanced patient care. This is your opportunity to mature in your approach to pharmacy practice and gain a variety of experiences to help you bring your intended career path into focus.

Under the guidance of a preceptor, you will find yourself serving as an integral member of many interdisciplinary teams, recommending strategies to optimize drug therapy to improve clinical outcomes and educating patients and their families about the optimal use of medications. In addition, you will gain a greater appreciation for the health-care ecosystem and the importance of building a well-coordinated and highly collaborative approach to improving health and health-care delivery. You will learn to master the use of a wide array of health information resources, to assume responsibility for medication optimization, to think critically and innovatively as you approach real-world problem solving and to uphold the highest standards of ethical decision-making and professionalism. You will likely have opportunities to work with and learn from pharmacy residents, as well as engage in the teaching and development of second- and third-year pharmacy students.

During this year, you are primarily engaged in pharmacy practice experiences beginning in the summer for a minimum duration of nine months. You will be assigned to a region of the state to complete the majority of your experiences. Pharmacy faculty based at these locations will personally guide and mentor you in your final year. You will practice in community pharmacies, health systems, outpatient primary care settings and within inpatient clinical and specialty teams applying your knowledge and skills to improve patient care and health-care delivery. In addition, opportunities exist for rotations in other areas, such as global engagement, the pharmaceutical industry, academia and government, with nearly one-third of your fourth-year experiences structured as elective opportunities to develop your interests and prepare you for your pharmacy career.
PY 4 Course Overview

Advanced Immersion (9 months)
Required = Community, Health-System, Ambulatory Care, General Medicine, Clinical I, Clinical II, Clinical III
Electives x 2

Leading Change in Healthcare I

Leading Change in Healthcare II

Prepared by Office of Curricular Innovation, updated February 2019
PHCY 898. Leading Change in Health Care I. 1 Credit.
This course is designed to build from foundational knowledge/skills gained during previous Immersion Experiences and coursework. Student Pharmacists will demonstrate advanced skills in critical literature appraisal and presentation, apply quality improvement methodologies to problems in pharmacy, and demonstrate understanding of pharmacy administration and healthcare policy fundamentals.
Requisite: Student pharmacists must successfully complete all required coursework, including Immersion Experiences and elective requirements in the first, second, and third professional years.

PHCY 899. Leading Change in Health Care II. 1 Credit.
This course is designed to build from foundational knowledge/skills gained during previous Immersion Experiences and coursework. Student Pharmacists will demonstrate advanced skills in critical literature appraisal and presentation, apply quality improvement methodologies to problems in pharmacy, and demonstrate understanding of pharmacy administration and healthcare policy fundamentals.
Requisite: Student pharmacists must successfully complete all required coursework, including Immersion Experiences and elective requirements in the first, second, and third professional years.

PHCY 891. Advanced Immersion Experience: Community. 4 Credits.
This course builds on foundational knowledge and skills gained during previous Immersion Experiences. Students will engage in a systems-based approach to quality improvement processes, develop practice management skills related to the medication use process, and refine skills in applying a consistent approach to patient care.
Requisite: Student pharmacists must successfully complete all required coursework, including Immersion Experiences and elective requirements in the first, second, and third professional years.

PHCY 889. Advanced Immersion Experience: Non-Patient Care Elective II. 4 Credits.
The non-patient focused elective provides students experience in unique pharmacy practice environments such as health care related professional societies, pharmaceutical industry corporate headquarters or manufacturing facilities, the FDA, etc. Students will utilize abilities learned previously in the curriculum to meet general course and site specific objectives.
Requisite: Student pharmacists must successfully complete all required coursework, including Immersion Experiences and elective requirements in the first, second, and third professional years.
Elective Courses: PY2 and PY3

PHCY 608i – Multidisciplinary Perspectives on Managing Diabetes Mellitus (2.0 credit hours)

This course examines the current issues involved in managing diabetes mellitus in persons over their life span. Contributions of the multidisciplinary team are an important theme throughout this course.

Prerequisite: PHCY 732

PHCY 624 – Research and Scholarship in Pharmacy I (1.5 credit hours)

This course is part of a three-course sequence built around a mentored, in-depth, scholarly project. Students will frame an answerable question with a faculty mentor, generate and interpret relevant data, and communicate their findings in an oral and written forum.

Prerequisite: PHCY 504 and Instructor Permission

PHCY 725 – Research and Scholarship in Pharmacy II (1.5 credit hours)

This is the second course in a three-course sequence that is built around a mentored, in-depth, scholarly project. Students will frame an answerable question with a faculty mentor, generate and interpret relevant data, and communicate findings in an oral and written forum.

Prerequisite: PHCY 624

PHCY 726 – Research and Scholarship in Pharmacy III (3.0 credit hours)

This is the third course in a three-course sequence that is built around a mentored, in-depth, scholarly project. Students will frame an answerable question with a faculty mentor, generate and interpret relevant data, and communicate findings in an oral and written forum.

Prerequisite: PHCY 725

PHCY 800 – Geriatric Pharmacy Practice (3.0 credit hours)

This course is designed to provide opportunities to enhance knowledge and skills in geriatric pharmacotherapy and other health disciplines involved in the care of seniors. This course will challenge students to identify and resolve health and medication use problems they may encounter while caring for older patients.
Prerequisite: PHCY 631

**PHCY 801 – Radiopharmacy I: Introduction to Radiopharmacy (2.0 credit hours)**

Radiopharmacy I introduces students to the use of radioactivity in medicine science, the practice of compounding, medical imaging, and the role of pharmacists in molecular imaging. This is the first course in the pathway for completing the didactic requirements of an Authorized Nuclear Pharmacist.

**PHCY 802 – Radiopharmacy II – The Drugs of Nuclear Medicine (2.0 credit hours)**

Radiopharmacy II is the second course in the series of radiopharmacy curriculum. While fundamental concepts were established in MOPH/PHCY 801, this course will delve into the instrumentation used in radiopharmacy as well as the biological effects of radiation.

Prerequisite: PHCY 801

**PHCY 803 – Radiopharmacy III (3.0 credit hours)**

Radiopharmacy III is the final course in the series of radiopharmacy curriculum. This course will focus sharply on the radiopharmaceuticals and ancillary drugs used in nuclear medicine. Time will also be devoted to ensure the students’ understanding of the use of radiopharmaceuticals in drug development and clinical research.

Prerequisite: PHCY 802

**PHCY 804 – Travel Medicine Care (1.5 credit hours)**

This course prepares students to deliver comprehensive travel medicine care to international travelers. Through readings, lectures, and case discussions, students learn key concepts of travel medications, vaccines, risk assessment and education. This knowledge is applied in a practice experience with a travel vaccine expert.

Prerequisite: PHCY 630

**PHCY 807 – Veterinary Pharmacotherapy (3.0 credit hours)**

This is an introductory level course providing students with knowledge and skills required to provide effective pharmaceutical care and compounds to non – human patients.

Prerequisite: PHCY 631

**PHCY 808 – Critical Care (3.0 credit hours)**
The course is designed to develop knowledge in common acute diseases encountered in the ICU by utilizing patient cases. Classes will focus on choice and rationale for therapy, dosing guidelines, and monitoring parameters. Two visits to the ICUs at UNC-CH are required.

Prerequisite: PHCY 631

**PHCY 810 – The Science of Pharmaceutical Compounding (1.0 credit hour)**

This course immerses students in the exploration of science utilized in contemporary pharmaceutical compounding. Students will investigate relationships between physiochemical principles and compounded preparatories, and develop strategies for preparing and assessing correctly and incorrectly compounded preparations.

Prerequisite: PHCY 513L, PHCY 515L

**PHCY 811 – Infectious Diseases (1.5 credit hours)**

This course expands student knowledge of the pharmacotherapy of bacterial, fungal, and viral infections. It also builds upon topics covered in the required PharmD curriculum, and introduces several new disease states. Presentations and course activities include case and evidence-based discussions led by infectious diseases faculty and practitioners.

Prerequisite: PHCY 631

**PHCY 812 – Pediatric Pharmacotherapy (1.5 credit hours)**

A comprehensive overview of developmental pharmacology and pharmaceutical management of various disease states in pediatric patients. Emphasis will be placed on nutrition management and pharmacokinetic recommendations for pediatric patients.

Prerequisite: PHCY 631

**PHCY 813 – Clinical Toxicology (1.5 credit hours)**

This course explores the clinical toxicology of drugs and chemicals and provides an overview of the clinical manifestations, assessment and treatment of poisonings with common drug, chemical and biological agents.

Prerequisite: PHCY 611, PHCY 630

**PHCY 814 – Disaster Preparedness and Emergency Care (1.5 credit hours)**
Students will learn about different types of disasters and the treatment of common disaster related injuries. They will also learn about strategies for health care delivery during disasters.

Prerequisite: PHCY 611, PHCY 630

**PHCY 817 – Making Medicine: The Process of Drug Development (1.5 credit hours)**

This course examines the drug development process and its connections to clinical research and healthcare outcomes through independent student exploration of on-line content followed by group activities and facilitated classroom discussion on important issues related to each state of the drug development process.

**PHCY 821 – Contemporary and Applied Communications in Healthcare (1.5 credit hours)**

This course is designed to prepare students who are interested in developing and enhancing their health communication skills across a broader range of constituents in the field of healthcare.

**PHCY 822 – Hematology/Oncology Pharmacotherapy (3.0 credit hours)**

This course explores non-pharmacologic treatment modalities, complications of cancer and treatment, supportive care issues and subspecialties and reviews current cancer screening and prevention guidelines and cancer research.

Prerequisite: PHCY 631

**PHCY 823 – International Clinical Classroom Case Discussion (2.0 credit hours)**

An elective offering interactions with pharmacy students from other countries, facilitated through the discussion and critical evaluation of relevant clinical cases highlighting pharmacotherapy issues.

Prerequisite: PHCY 630

**PHCY 830 – Introduction to Drug Development (2.0 credit hours)**

Topics covered include preclinical drug safety evaluation, preclinical pharmacology, design of protocols for Phases I-IV, FDA guidelines for clinical study, preparation of study plan, statistics in clinical trials, data analyzing, and FDA interactions with industry.

Prerequisite: PHCY 630
PHCY 832 – Innovations in Community-Based Pharmacy Practice (1.5 credit hours)

Community-based pharmacist practitioners routinely provide enhanced patient care services to meet health care needs in the communities they serve. This course will expose students to novel ways in which community-based pharmacists are leading change and providing patient care, including but not limited to health and wellness services, immunization services, medication management, chronic care management services, care transitions with medication reconciliation, and specialty pharmacy. Students will also complete the National Association of Chain Drug Stores (NACDS) Community Pharmacy-based Point-of-Care Testing Certificate Program (fee associated).

Prerequisite: PHCY 501

PHCY 833 – Advanced Cardiovascular Pharmacotherapy (3.0 credit hours)

This course provides an in-depth discussion of the pharmacotherapy of major cardiovascular diseases such as hypolipidemia, hypertension, ischemic heart disease, heart failure, and arrhythmias.

Prerequisite: PHCY 631

PHCY 836 – Prevention, Treatment, and Recovery of Substance Use Disorders (1.5 credit hours)

There is a crippling opioid epidemic in the US stemming from decades of misguided approaches to addiction. This course addresses prevention, treatment, and recovery of substance use/misuse disorders, exploring addiction as a chronic brain disease with societal and economic factors contributing to development and progression.

Prerequisite: PHCY 631

PHCY 837 – Pharmacogenetics (1.5 credit hours)

Pharmacogenetics covers the generation of pharmacogenetics data, the analysis of that data, and the development the reporting structure of gene/drug interactions. Students will investigate data analysis tools for pharmacogenetics, and review clinical outcomes data and clinical case studies.

PHCY 839 – Global & Rural Health: Maximizing Interprofessional Teams to Impact Patient Outcomes (1.0 credit hour)

Global and rural health share public health approaches when identifying and implementing healthcare solutions. This course explores approaches, while engaging students in interprofessional, project-based learning. Students across multi-healthcare disciplines will explore cross-cultural communication, the social determinants of health, and service delivery in low resource settings.
PHCY 840 – Health Policy and Managed Care (3.0 credit hour)

This course is designed to expand students’ understanding of health policy and managed care from system-level and payer perspectives, with an emphasis on the intersection of these broad topics and the profession of pharmacy. The precursor, US Healthcare Systems, lays a foundation for basic understanding of the healthcare environment and the evolving role of the pharmacist. This course builds upon this content through in-depth exploration of relationships between health policy actors, the role of managed care in controlling costs, and the drive towards value. As a result of this course, students will be well-prepared to enter careers in pharmacy for which knowledge of health policy and managed care is essential. These includes professional advocacy, regulatory affairs, market access, and managed care.

Prerequisite: PHCY 609

PHCY 846 – Perspectives in Mental Health (2.0 credit hour)

The course is a 2-credit hour course designed to meet the needs of pharmacy students with an interest in further developing their knowledge base in psychiatry and select neurology topics. Most class sessions consist of instructor-led presentation of the disease state background, followed by Literature Review and Roundtable Discussion, then time for patient case work up or movie reflections. Lastly, students will work in their groups for completion of various longitudinal projects for the course related the neuropsychiatric pharmacotherapy and healthcare issues. Each content area is facilitated by an instructor with expertise in that topic area, and instructor-led sessions will focus on: 1) For neuropsychiatric therapeutic topics – background of disease, choice and rationale for therapy, dosing guidelines, monitoring parameters for assessment of efficacy and toxicity, and application in clinical practice, or 2) Non-therapeutic mental health topic- background of topic and application in clinical practice and/or target audience. For each instructor broad topic, there will also be a student-led roundtable-style review of the literature and facilitated discussion on a related but more narrowed, focused topic. Starting with Week 2, there will be post-class assessment in Sakai based on the instructor led-topic and key points from the student-led topic. On all days, a portion of class time will be spent on working in teams on a patient case related to the topic of the week with a few days with dedicated time viewing and a discussion of psychiatry in cinematography. The subject material is designed to be an extension, rather than duplication of information provided in previously required pharmacotherapy courses. Prerequisite: PHCY 631

PHCY 841 – Rural Pharmacy Health 1: Introduction to Rural Pharmacy Practice (1.5 credit hour)

This one credit course is the first in a four semester course sequence intended to facilitate skill development in rural pharmacy practice. This course is part of the Rural Pharmacy Health Certificate Program. It is designed to provide the foundational concepts in rural pharmacy health that enable Rural Health Scholars to better assume his/her future role(s) in rural pharmacy practice, community engagement and leadership. The course includes didactics, small group work, experiential education and service learning.
Requisite: Rural Health Scholars only

**PHCY 842 – Rural Pharmacy Health 2: Introduction to Rural Pharmacy Practice (1.5 credit hour)**

This one credit course is the second in a four-semester course sequence intended to facilitate skill development in rural pharmacy practice as part of the Rural Pharmacy Health Certificate Program. This course has been designed to further explore health issues surrounding the different populations of patients in rural Western North Carolina. Discussions of the impact of “Implicit Bias”, cultural awareness and strategies for minimizing the negative outcomes often associated with health disparities. The course includes didactics, small group work, experiential education, and community engagement.

Prerequisite: PHCY 841

**PHCY 843 – Rural Pharmacy Health 3: Introduction to Rural Pharmacy Practice (1.5 credit hour)**

This one credit course is the third in a four-semester course sequence intended to facilitate skill development in rural pharmacy practice as part of the Rural Pharmacy Health Certificate Program. This course has been designed to facilitate interprofessional, collaborative practice experiences for the UNC Eshelman Rural Pharmacy Health Scholars and The Kenan Primary Care Medical Scholars who are both located on the Asheville campuses. This course includes small group work, experiential education and community engagement.

Prerequisite: PHCY 842

**PHCY 844 – Rural Pharmacy Health 4: Introduction to Rural Pharmacy Practice (1.0 credit hour)**

This one credit course is the fourth in the Rural Pharmacy Health Certificate Program. The course introduces emerging models of population health management and examples of care under the Affordable Care Act and Accountable Care Organizations. This course also begins the research and project preparation work. Rural Scholars are required to complete a research/quality improvement project during their 4th year of the PharmD program. This course includes small group work, experiential education, engaged discussion.

Prerequisite: PHCY 843

**PHCY 851—Foundations in Ambulatory Care (2.0 credit hours)**

This course will introduce Ambulatory Care Scholars to the history of ambulatory care practice and provide participants with an overview of the types of services provided by ambulatory care pharmacists, the variety of practice settings available, and advocacy and legislative issues facing the profession. Students will network with regional and national thought leaders in ambulatory care and be paired with a PGY1 ambulatory care pharmacy resident through a mentoring program. This course is a survey course for
ambulatory care practice management and will serve as a strong foundation for future courses in the Ambulatory Care Program. Students should expect to participate in activities outside of class including an interprofessional case discussion and mentoring meetings.

Prerequisite: PHCY 501

**PHRS 815 – Foundations in Implementation Science: Examples in Precision Health and Society (1.5 credit hour)**

It has been estimated that it takes 17 years for 14% of research to benefit patient care; further, patients only receive approximately 55% of guideline recommended care. The goals of implementation science and precision health are to figure out ways to get the right care to the right patients at the right time. Implementation science is defined as the study of methods to promote the translation of evidence-based practices, interventions, and policies related to precision health into practice settings to improve patient and population health. This course will cover the fundamentals of implementation science using examples in precision health (e.g., targeted therapies, pharmacogenomics, and tailored treatment plans). More specifically, we will discuss frameworks, strategies, study designs, and outcomes related to implementation science using examples related to the implementation of precision health in research and practice. We will apply these learnings to implementation challenges, so that future pharmacists and researchers alike can consider the application of implementation science to their own work to improve patient and population health. This course is offered every other spring, odd years.

**Health Affairs Electives**

**Health Affairs Electives:** Electives that enhance a student’s ability to improve patient health

See the [PharmD Student Handbook](#) for information about how health affairs electives may count toward PharmD curriculum requirements. Petitions for individualized plans of study (any elective course work that deviates from the elective policy) must be approved, in advance, by the Curriculum and Assessment Committee. Petitions must be made in writing and submitted a minimum of 45 days prior to the semester in which you wish to enroll in the course. These petitions may be submitted via email to the School registrar who serves on the Curriculum and Assessment Committee.

Students should check the [UNC Course Catalog](#) and schedule of courses to see if/when health affairs electives taught by other Schools and/or departments at UNC are offered.
**Specialized Areas of Learning: Research and Scholarship (RASP)**

**Research and Scholarship in Pharmacy (RASP)** is a longitudinal, selective pathway within the Doctor of Pharmacy elective curriculum that is built around a **mentored, in-depth, scholarly project** where each student will (1) frame an answerable question with a faculty mentor, (2) generate and interpret relevant data, and (3) communicate their findings in an oral and written form.

This experience could include hypothesis-driven research (e.g., preclinical, translational, clinical, epidemiologic, health services, educational) or non-hypothesis driven research (e.g., method development and validation, quality improvement).

Students entering this selective pathway will enroll in *Research and Scholarship in Pharmacy 1* (PHCY 624, 1.5 credits) in the PY2 spring semester, *Research and Scholarship in Pharmacy 2* (PHCY 725, 1.5 credits) in the PY3 fall semester, and *Research and Scholarship in Pharmacy 3* (PHCY 726, 3.0 credits) in the PY3 spring semester.

Over the course of this longitudinal experience, students will gain skills and achieve learning outcomes through self-directed learning, attending and actively participating in a weekly common hour, development and execution of their project, completion of 4 RASP deliverables, and guidance and instruction by their faculty mentor. Although project progression will vary by student and project, a general framework and timeline of key events is outlined below.

- **Deliverable #1**: written project proposal (completed during RASP 1)
- **Deliverable #2**: oral project proposal presentation and revised written proposal (completed during RASP 2)
- **Deliverable #3**: oral poster presentation (completed during RASP 3)
- **Deliverable #4**: written final manuscript/report (completed during RASP 3)

Students that successfully complete the RASP pathway and its requirements will be eligible to graduate with Honors (provided they meet the University GPA requirement of ≥3.3 and submit an approved Honors Carolina thesis document).

Questions? Contact Dr. Craig Lee at craig_lee@unc.edu
**Specialized Areas of Learning: Rural Pharmacy Health Certificate**

The Rural Pharmacy Health Certificate is a focused program of study that prepares student pharmacists for collaborative, interprofessional practices that serve the health care needs of North Carolinians living in rural and small communities. This concentration within the Doctor of Pharmacy (Pharm.D.) degree is ideal for individuals who want to live and practice in rural areas and small towns.

The UNC Eshelman School of Pharmacy offers this uniquely on the Asheville campus as part of the School’s commitment to increasing the number of pharmacists practicing in rural, Western North Carolina.

Students may apply to become a Rural Pharmacy Health Scholar during the spring semester of their PY1 (1st) year of the Pharm.D. program.

The demand for pharmacists is often higher in rural communities where access to medical services may be limited by geography, distance and economic challenges. The Rural Pharmacy Health Certificate prepares individuals who enjoy small-town life for a satisfying, service-oriented rural pharmacy career. The Rural Pharmacy Health faculty offer mentoring and practice experiences that focus on the needs of residents in smaller communities. The courses offered in the Certificate include focused study on:

- Population Health Management
- Cultural Competency in Healthcare
- Introduction to Rural Populations
- Health Disparities
- Impact of Social Determinants of Health in overall patient outcomes

While providing community service and outreach, scholars build relationships with local government, non-profits, safety-net organizations and public health providers.

Making an impact on the health of a community does not just happen in a medical practice or pharmacy. Impact happens when committed people come together and make a difference in the life of a community overall. Rural pharmacists are vital, well respected members of not only the healthcare team, but also the town, school and business communities they serve. Scholars who successfully complete the Rural Pharmacy Health Certificate emerge as leaders in their local communities.

To learn more contact Stephanie Kiser at stephanie.kiser@unc.edu or 828.250.3956.
**Specialized Areas of Learning: Global Pharmacy Scholars**

As the world becomes more interconnected, it is important for our students to have transferrable skills such as cultural competence, global awareness, service learning, and the ability to analyze and solve problems through different perspectives and in different settings. The Global Pharmacy Scholars (GPS) program develops these skills within the next generation of student pharmacists who will lead efforts to create innovative solutions to existing global dilemmas within health care and beyond.

Our Global Pharmacy Scholars program sends more than 50 students annually to one of nine international locations for a one-month Advanced Pharmacy Practice Experience rotation. Students are exposed to different health care systems, cultures, and may participate in research initiatives with other academic institutions and organizations at select sites.

The mission of the GPS program is to:
- enable students to learn about health care issues in various countries around the world,
- expose students to different cultures and healthcare systems,
- extend scholarship opportunities available to students and faculty,
- develop the next generation of global leaders in pharmacy.

**Practice Sites**
- Chisinau, Moldova
- London, U.K.
- Colomarigua, Honduras
- Addis Ababa, Ethiopia
- Lusaka, Zambia
- Lilongwe, Malawi
- Mysuru, India
- Tokyo, Japan
- Melbourne, Australia