

PharmD Curriculum Guide



ESHELMAN SCHOOL
OF PHARMACY

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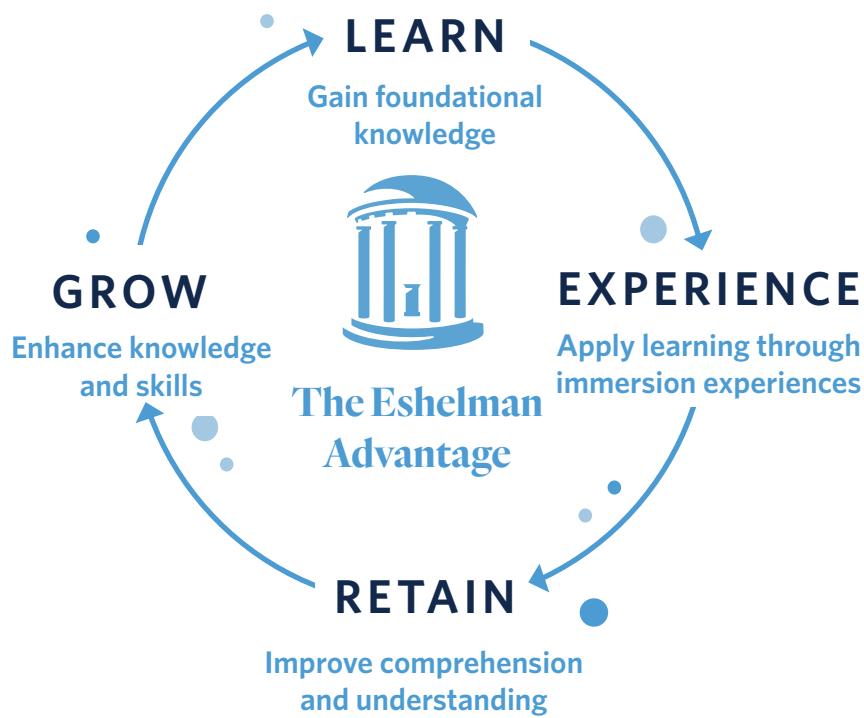
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The Eshleman Advantage

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 before 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. Students also have more opportunities to develop leadership skills and experience with increased emphasis on inquiry, research, innovation, and problem solving.



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 lead 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 seventeen months. You will also dedicate time to developing skills necessary for inquiry, problem solving, and innovation.

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 Inquiry and Innovation

- Early experiences in the real-world practice of pharmacy followed by reflection and discussion
- Hands-on pharmacy innovation and problem solving
- 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 pathways of learning in Research and Scholarship (RASP), Rural Healthcare and Global Pharmacy (GPS).

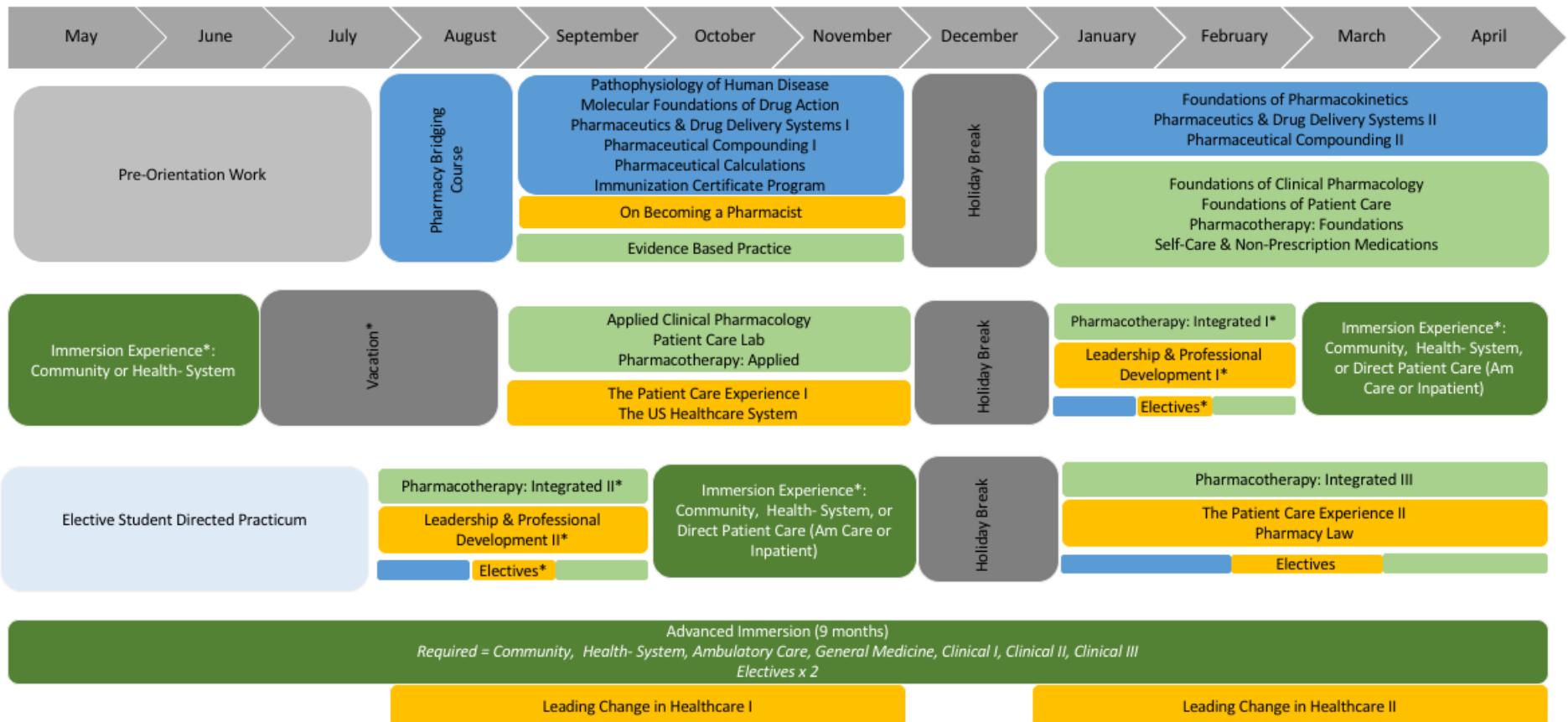
Pharm.D. Program Accreditation

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.

UNC Eshelman School of Pharmacy Curriculum Overview



■ Foundational Science Stream ■ Leadership and Professionalism Stream ■ Pharmacotherapy Stream (Residential) ■ Pharmacotherapy Stream (Experiential)

* Schedule for one of two cohorts

Prepared by Office of Curricular Innovation, updated February 2019

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

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
- Evidence-Based Learning
- 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 seven 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)
- Pharmaceutics and Drug Delivery Systems (spring)
- Pharmacokinetics (spring)
- Clinical Pharmacology (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.

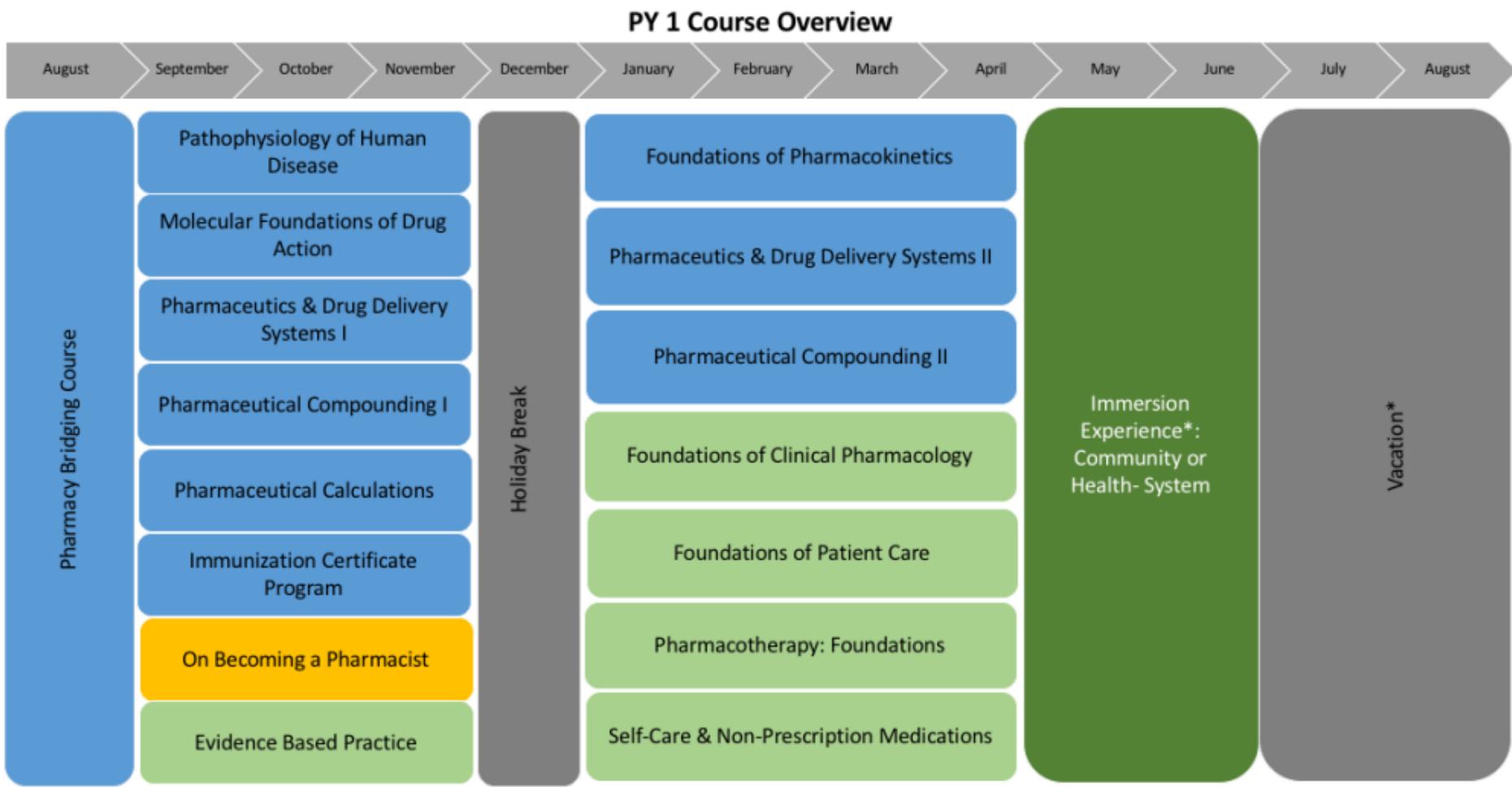
The factual content of the courses is thoughtfully packaged and available to you for self-directed learning outside of class. Class time is devoted to faculty-student interactions and higher forms of thinking and problem solving.

Foundations of Patient Care

An eighth course prepares you for early patient care in a real-world setting by emphasizing connections among content areas and giving you the foundational knowledge and skills needed to begin caring for patients.

Hands-On Learning

In parallel with the major courses noted above, you'll be engaged in a set of courses that allow you to practice and develop proficient skills in pharmacy. These courses include self-guided online modules in Pharmaceutical Calculations and Medical Terminology, as well as a laboratory course in Pharmaceutical Compounding. In addition, you will earn an Immunization Certificate that will allow you to immunize patients as early as your third month on campus.



PY1 Fall Courses

HCY 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.

Prepared by Office of Curricular Innovation, updated February 2019

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.

PY1 Spring Courses

PHCY 510 - Foundations of Clinical Pharmacology (3.5 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.

PHCY 511 - Foundations of Pharmacokinetics (3.5 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.

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

PHCY 515L is an introduction to the science and practice of sterile compounding in the US.

PHCY 516 - Foundations of Patient Care (3.0 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.

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.

PHCY 529 - Pharmacotherapy: Foundations (3.0 hours)

Prerequisites, PHCY 502, 503. Co-requisite, 516. 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.

Year Two: Immersion in Patient Care and Engagement in Inquiry and Innovation

- Early experiences in the real-world practice of pharmacy followed by reflection and discussion
- Hands-on pharmacy innovation and problem solving
- Small-group and large-classroom experiences to further learning, professional development, and career-path exploration
- Immersion begins the summer after the first year.

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 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 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

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 problem-based learning in pharmacotherapeutic decision-making that integrates advanced clinical pharmacology and pharmacokinetics. We also set aside time for you to study emerging topics and take elective courses.

Seeking Solutions

Beginning in the third semester, you will participate in a project designed to foster inquiry, critical thinking and innovation. This experience focuses on real-world problems and shows you that there is a common process for identifying and framing problems so that you can develop effective solutions.

Our goal is to train your mind to naturally seek solutions to problems you encounter in order to address society's needs through innovation. This positions you to be a curious and creative professional, change agent and leader. These "habits of mind" and problem-solving abilities will define you as an inquisitive and scholarly practitioner ready to take on the challenges of a rapidly changing health-care world.

Think About It

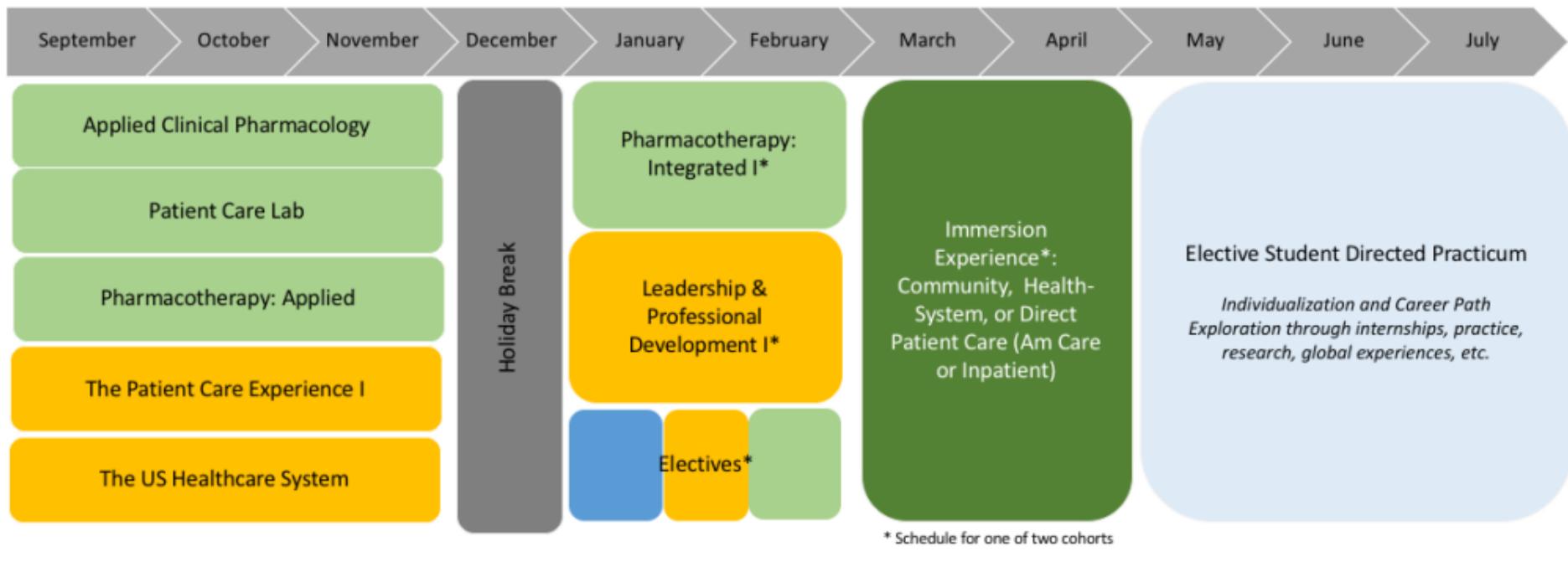
Learning by doing is an incomplete proposition. What really enables you to learn is reflection. In other words, you have to do and then think about what you did.

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



■ Foundational Science Stream ■ Leadership and Professionalism Stream ■ Pharmacotherapy Stream (Residential) ■ Pharmacotherapy Stream (Experiential)

Prepared by Office of Curricular Innovation, updated February 2019

Summer PY2 Courses

PHCY 591 – Immersion Experience 1 (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. Prerequisites: PHCY 506, PHCY 508, PHCY 513, and PHCY 516.

Fall PY2 Courses

PHCY 601 - 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. Prerequisite: PHCY 516.

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

The US Healthcare System 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. Prerequisite: PY2 standing.

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 511, PHCY 512.

PHCY 617 - The Patient Care Experience (2.0 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. Prerequisite: PY2 standing.

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. Prerequisite: PY2 standing.

Spring PY2 Courses

PHCY 631 - Integrative Pharmacotherapy I (5.0 credits)

Integrative 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.

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.

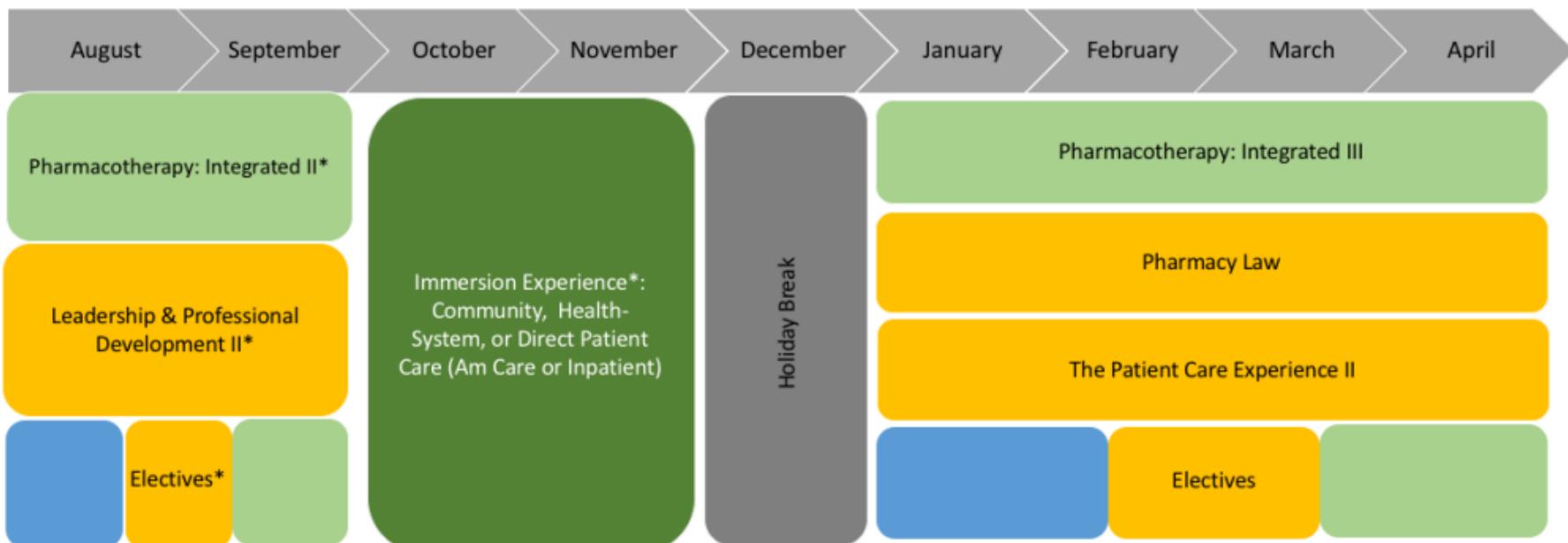
PHCY 691 - Immersion Experience 2 (8.0 credits)

The Immersion Experience 2 is designed to allow student pharmacists to provide patient-centered collaborative care that will optimally prepare students for the Advanced Pharmacy Practice Experiences in the fourth professional year. Prerequisites: PHCY 504, PHCY 591, PHCY 601, PHCY 611 and PHCY 630.

Year Three: Continue Immersion in Patient Care and Engagement in Inquiry and Innovation

- Early experiences in the real-world practice of pharmacy followed by reflection and discussion
- Hands-on pharmacy innovation and problem solving
- 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

■ Foundational Science Stream ■ Leadership and Professionalism Stream ■ Pharmacotherapy Stream (Residential) ■ Pharmacotherapy Stream (Experiential)

Prepared by Office of Curricular Innovation, updated February 2019

Fall PY3 Courses

PHCY 732 – Integrative Pharmacotherapy II (5.0 credits)

Integrative 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 630, 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 identity within teams, while learning effective strategies to maximize team members' strengths. Prerequisite: PHCY 636

PHCY 791 - Immersion Experience 3 (8.0 credits)

This course is designed to allow student pharmacists to provide patient-centered collaborative care that will optimally prepare students for the Advanced Pharmacy Practice Experiences in the fourth professional year. Prerequisite: PHCY 631, PHCY 691

Spring PY3 Courses

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. Prerequisite: PY3 standing

PHCY 733 - Integrative 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



■ Foundational Science Stream ■ Leadership and Professionalism Stream ■ Pharmacotherapy Stream (Residential) ■ Pharmacotherapy Stream (Experiential)

Prepared by Office of Curricular Innovation, updated February 2019

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: PY3 standing. Spring.

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. Prerequisites: PHCY 504 and 621. Spring. Click [here](#) for more information regarding the RASP pathway.

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. Fall. Click [here](#) for more information regarding the RASP pathway.

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. Spring. Click [here](#) for more information regarding the RASP pathway.

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: PY3 standing. Spring.

PHCY 801 – Radiopharmacy I: Introduction to Radiopharmacy (1.0 credit hour)

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. Prerequisite: PY2 standing. Spring.

PHCY 802 - Radiopharmacy II (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. Fall.

PHCY 803 - Radiopharmacy III: The Drugs of Nuclear Pharmacy (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. Spring.

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: PY2 or PY3 standing. Spring.

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: PY3 standing. Spring.

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: PY3 standing. Spring.

PHCY 809 - Effective Teaching Strategies for Health Sciences Education (1.5 credit hours)

This course prepares professional students in pharmacy and other health professions to adapt and apply effective, research-based strategies and skills to design, promote, and assess learning in a variety of settings, including: large- and small group teaching, precepting, continuing professional education, and/or patient and community health education. Prerequisite: PY2 or PY3 standing. Spring.

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: PY2 or PY3 standing. Spring.

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: PY3 standing. Fall.

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: PY3 standing. Fall.

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: PY2 or PY3 standing. Spring.

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: PY2 or PY3 standing. Fall.

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. Prerequisite: PY2 or PY3 standing. Spring.

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. Prerequisite: PY2 or PY3 standing. Spring.

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: PY3 standing. Spring.

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: PY2 or PY3 standing, permission of instructor. Spring.

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: PY3 standing. Location: Cato Research in RTP. Spring.

PHCY 831 - Applied Case Studies in Self Care Therapeutics (1.5 credit hours)

This course utilizes a systematic process to quickly and accurately assess patients for self-care treatment. Team-based learning will engage students in discussion on the appropriate use of nonprescription medications, dietary supplements, and herbal products. Students will apply skills in literature evaluation and practice communicating recommendations to patients and healthcare providers. Prerequisite: PY3 standing. Fall.

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: PY3 standing. Spring.

PHCY 834 - 21st Century Independent Pharmacy Ownership (3.0 credit hours)

Independent community pharmacy is a rapidly changing health care industry. In this course, we will explore topics relevant to a career in independent pharmacy including: healthcare policy; supply chain; business and reimbursement models and evolving practice models. Prerequisite: PY3 standing. Spring.

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: PY3 standing. Fall.

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. Prerequisite: PY3 standing. Fall.

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. Prerequisite: PY2 or PY3 standing. Spring.

Elective Courses: Health Affairs

Definition of Health Affairs Electives: Electives that enhance a student's ability to improve patient health

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.

UNC-Chapel Hill

Anthropology (ANTH)

ANTH 470: Medicine and Anthropology (FOLK 470) (3). This course examines cultural understandings of health, illness, and medical systems from an anthropological perspective with a special focus on Western medicine.

Biostatistics (BIOS)

BIOS 511: Introduction to Statistical Computing and Data Management (4). Required preparation, previous or concurrent course in applied statistics. Permission of instructor for nonmajors. Introduction to use of computers to process and analyze data, concepts and techniques of research data management, and use of statistical programming packages and interpretation. Focus is on use of SAS for data management and reporting.

BIOS 600: Principles of Statistical Inference (3). Required preparation, knowledge of basic descriptive statistics. Major topics include elementary probability theory, probability distributions, estimation, tests of hypotheses, chi-squared procedures, regression, and correlation.

English and Comparative Literature (ENGL)

ENGL 303: Advanced Expository Writing for the Natural Sciences (3). Advanced practice with the oral and written discourse of the natural sciences. Special attention to disciplinary rhetoric, style, genre, format, and citation.

Epidemiology (EPID)

EPID 600: Principles of Statistical Inference (3). Required preparation, knowledge of basic descriptive statistics. Major topics include elementary probability theory, probability distributions, estimation, tests of hypotheses, chi-squared procedures, regression, and correlation.

Exercise and Sports Science (EXSS)

EXSS 188: Emergency Care of Injuries and Illness (3). Theory and practice of basic first aid, cardiopulmonary resuscitation, and the acute care of athletic injuries.

Geography (GEOG)

GEOG 445: Medical Geography (3). The human ecology of health is studied by analyzing the cultural/environmental interactions that lie behind world patterns of disease distribution, diffusion, and treatment, and the ways these are being altered by development. (GHA)

Health Behavior and Health Education (HBHE)

HBHE 709: U.S. Populations of Color (3). This course explores the various structural forces that impact the health status and health behaviors of populations of color in the United States.

HBHE 727: Patient Advocacy (3). Explore competing definitions of patient advocacy. Topics related to ethics, policy, and law will be covered in the context of what have often been termed patient rights and responsibilities. Three lectures hours per week.

HBHE 772: Planning Public Health Interventions (3). In this course, students use a comprehensive planning model to plan, implement, and evaluate an evidence-based intervention that addresses a public health problem within a defined population.

Health Policy and Management (HPM)

HPM 220: Writing for Health Administrators (3). Focuses on communication skills development, with an emphasis on clarity, conciseness, and effectiveness of writing memoranda, reports, proposals, letters.

HPM 230: Management of Human Resources (3). Introduction to the field of human resource management in health organizations in the United States. Detailed treatment of selected topics with a view to help develop operational skills.

HPM 330: Introduction to Organization Leadership, Management, and Behavior (3). Restricted to HPM B.S.P.H. students. Introduction to the roles of managers in health organizations. Emphasizes a systems perspective of organizations.

HPM 510: Global Perspectives on Ethical Issues in Health Policy and Management (3). This course will address the ethical issues of health policy and management, with particular attention to the global perspectives on these issues. These global perspectives are both comparative and trans-national.

HPM 715: Health Economics for Policy and Management (3). Prerequisite, BIOS 600. Permission of the instructor for nonmajors. Provides training in the theory of health economics and applies this theory to important issues in health policy and management.

HPM 757: Health Economics for Policy and Management (3). This course focuses on the political and policy dynamics of health care reform.

Master of Business Administration (MBA)

MBA 893: The Challenge of Healthcare – A System Overview (1.5). This course provides a broad overview of the world of health care from a business perspective. Students will be introduced to the structure and component parts of the health care system and will study basic economic issues, public policies, and market developments as they impact the industry and the delivery of care and services.

Microbiology and Immunology (MCRO)

MCRO 614: Immunobiology (3). A strong background in molecular biology, eukaryotic genetics, and biochemistry is required. Advanced survey course with topics that include molecular recognition, genetic mechanisms of host resistance, development of cells and cell interactions; hypersensitivity, autoimmunity, and resistance to infection. Course material from textbook and primary literature.

MCRO 630: Virology (3). Required preparation, coursework in molecular biology and cell biology. Current concepts of the chemistry, structure, replication, genetics, and the natural history of animal viruses and their host cells.

MCRO 631: Advanced Molecular Biology I (3). Required preparation for undergraduates, at least one undergraduate course in both biochemistry and genetics. DNA structure, function, and interactions in prokaryotic and eukaryotic systems, including chromosome structure, replication, recombination, repair, and genome fluidity. Three lecture hours a week.

Nursing (NURS)

NURS 870: Health Care Informatics (3). Focuses on developing an understanding of the concepts relevant to health care informatics and the use of computerized information systems, as well as the use of computer applications to support clinical and administrative decision making.

Nutrition (NUTR)

NUTR 240: Introduction to Human Nutrition (3). Prerequisites, BIOL 101/101L and CHEM 102/102L. Relationships of human nutrition to health and disease. Integration of biology, chemistry, and social sciences as related to human function. Nutrient composition of foods and safety of the food supply.

NUTR 400: Introduction to Nutritional Biochemistry (3). Prerequisites, BIOL 101, CHEM 101 and 102, and NUTR 240. Permission of the instructor for students lacking the prerequisites. Function of the human body focusing on nutrient interaction. Review of structure and function of cells and organs. For advanced undergraduates and graduate students needing to enhance background prior to NUTR 600.

NUTR 600: Human Metabolism: Macronutrients (3). Prerequisite, NUTR 400. Permission of the instructor for students lacking the prerequisite. Cell biochemistry and physiology emphasizing integration of proteins, carbohydrates, and lipids in whole-body metabolism; regulation of energy expenditure, food intake, metabolic adaptations, and gene expression; and macronutrient-related diseases (atherosclerosis, obesity).

NUTR 611: Nutrition of Children and Mothers (MHCH 611) (3). Prerequisite, NUTR 400. Permission of the instructor for students lacking the prerequisite. Biologic bases for nutrient requirements and dietary recommendations as they vary throughout the life cycle. Covers the nutritional needs of women during childbearing years, infants, children, and adolescents.

NUTR 620: Human Metabolism: Micronutrients (3). Prerequisites, NUTR 400 and 600. Permission of the instructor for students lacking the prerequisites. Cell biochemistry and physiology emphasizing metabolism of vitamins and minerals including antioxidant protection, immune function, nutrient control of gene expression, and disease states induced by deficiencies (e.g., iron-deficient anemia).

NUTR 700: Nutrition in Medicine (2). Prerequisites, BIOL 252 and NUTR 600. Comprehensive review of nutrition basics with strong clinical perspective. Integrates nutrient biochemistry and metabolism into a framework of nutritional assessment and dietary intervention.

Psychology (PSYC)

PSYC 101: General Psychology (3). A survey of major principles of psychology and an introduction to scientific modes of thought about behavior. Students participate in ongoing psychological research in the department. PSYC 101 is a prerequisite for all psychology courses.

PSYC 245: Abnormal Psychology (3). Prerequisite, PSYC 101. Major forms of behavior disorders in children and adults, with an emphasis on description, causation, and treatment.

PSYC 250: Child Development (3). Prerequisite, PSYC 101. Study of the development of social and intellectual behavior in normal children and the processes that underlie this development. Emphasis is typically on theory and research.

PSYC 320: Drugs and Human Behavior (3). Prerequisite, PSYC 101. This course will examine the use of drugs to alter behavior. Social implications of drug use and methods for preventing and treating drug abuse also will be considered.

PSYC 502: Psychology of Adulthood and Aging (3). Prerequisites, PSYC 101 and 250. A developmental approach to the study of adulthood, from young adulthood through death. Topics include adult issues in personality, family dynamics, work, leisure and retirement, biological and intellectual aspects of aging, dying, and bereavement.

Public Health (PUBH)

PUBH 420: AIDS: Principles and Policy (1). Elective course jointly given by the schools of Dentistry, Public Health, Nursing, Pharmacy, and Medicine, designed to provide a multifaceted understanding of social, clinical, and biological aspects of the AIDS epidemic.

PUBH 610: Introductory Spanish for Health Professionals (3). This course is designed to provide undergraduate and graduate health professional and social work students with introductory-level Spanish skills the opportunity to develop their own skills.

PUBH 613I: Intermediate Spanish for Health Care 1 (3). Required preparation, college-level Spanish 2 and a minimum score on a self-assessment test available on the Web. Permission of the instructor. This primarily e-learning course provides public health students with the opportunity to improve their oral communication skills in Spanish at the intermediate level via DVD, Web, and workbook.

PUBH 615I: Advanced Spanish for Health Care I (3). Required preparation, college-level Spanish 3 and a minimum score on a self-assessment test available on the Web. Permission of the instructor. This primarily e-learning course provides public health students with the opportunity to improve their oral communication skills in Spanish at the advanced level via DVD, Web, and workbook.

Sociology (SOCI)

SOCI 431: Aging (3). The process of aging from birth to death, with a concentration on the later years of life, examined from a broad perspective. Topics include individual change over the life-course, the social context of aging, and the aging of American society.

Women's and Gender Studies (WMST)

WMST 563: Introduction to Women's Health and Health Education (3). Permission of the instructor. An overview of women's health emphasizing their specific interest as family and community members, as patients, and as health professionals. Implications for health education practice and research.

Other Universities

Note: Please contact institution where course is offered to enroll.

Mercer University PHA 505: Community Pharmacy Ownership (2). A course designed to provide the student with the information necessary to become a community pharmacy owner either through the establishment of a new pharmacy or the purchase of an existing pharmacy practice. The knowledge necessary for efficient and profitable management in layout and design, location analysis, evaluation of third party plans, and promotion are emphasized as well as the financial aspects of the development and implementation of innovative clinical services in the community setting. The course includes case studies and group projects in addition to didactic classes. [Link to site.](#)

Professional Compounding Centers of America (PCCA): Pharmaceutical Care and Compounds for Veterinary Patients (2). The course will take an in-depth look at disease states and drug therapy for various species including canine, feline, equine, and exotics. The course trains students in comprehensive veterinary pharmacotherapy and applications to compounding for veterinary patients. Students will complete online reading assignments, case studies, and other coursework to further enhance their learning. [Link to site.](#)

The University of New Mexico Health Sciences Center PHARM 720: Introduction to Nuclear Pharmacy (2). The course provides an overview of nuclear pharmacy as a practice specialty. Students will examine the basic scientific principles applicable to nuclear pharmacy and nuclear medicine; review the tasks routinely performed by a nuclear pharmacist and the regulatory requirements under which they operate; examine the contributions of the nuclear pharmacist and nuclear pharmacy in the diagnosis and treatment of disease; and study the application of radioactive tracer techniques used in the diagnosis and treatment of patients. [Link to flier.](#)

University of Florida PHA 6935: Veterinary Pharmacy (2). Fundamentals of human nutrition, including the functions and essential nutrients necessary for optimum growth and the maintenance of physical and mental health. Open to all students. [Link to site.](#)

The University of Utah SW 6860: School on Alcoholism and Other Drug Dependencies (1)*. Two week intensive program held during Summer Semester only, focusing on traditional intervention models, current cutting-edge trends in assessment/prevention/treatment, evidence-based practice models and non-traditional holistic approaches designed to benefit both clients and care-givers. [Link to site.](#)

*The University of Utah awards two (2) hours for course completion. One (1) hour can be transferred to fulfill PharmD elective requirements.

Specialized Pathways 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 Pathways 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 Pathways 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



UNC

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