Admission to the Ph.D. Program

Applicants who have completed a standard collegiate curriculum in pharmacy, chemistry, biochemistry, biology, engineering, or in an allied field in the University, or in other universities or colleges having curricula acceptable to UNC—Chapel Hill's Graduate School, are eligible for admission to the graduate program in pharmaceutical sciences. Applicants must submit Graduate Record Examination scores, letters of recommendation, official transcripts, and a statement of personal goals as they relate to graduate study at the UNC Eshelman School of Pharmacy.

The Graduate School online application (http://gradschool.unc.edu/admissions/) is the standard means of applying for admission. Inquiries concerning admission to programs in the pharmaceutical sciences may be directed to the Office of Curricular and Student Affairs, CB# 7566, 109 Beard Hall, Chapel Hill, NC 27599-7566.

All applications to the UNC Eshelman School of Pharmacy's Ph.D. in pharmaceutical sciences program must be submitted through the UNC Graduate School.

Deadlines

Review of applications begins December 1 and we strongly recommend that applications are completed prior to that deadline. Although you can apply until February 13, completing your application before December 1 will maximize your chances of acceptance and nomination for UNC Graduate School fellowships.

Application Requirements

- Graduate School application
- Nonrefundable $87.50 application fee
- Three current letters of recommendation: When filing out the Graduate School application, applicants will be asked to submit the e-mail addresses of the recommenders, who will then receive an e-mail with information for logging into the system to submit their letters.
- Transcripts
- GRE test scores that are no more than five years old
- Statement of purpose (see below)
- A current e-mail address (the Graduate School only uses e-mail to communicate with applicants)

Notes

- For Question 2 on the application, make sure you scroll down the list until you see “School of Pharmacy.” In the dropdown menu for School of Pharmacy, please select Pharmaceutical Sciences.
- Applicants must indicate only one choice on their application for their division of interest or specialization. Only the first choice of division (i.e. area of interest or specialization) will be considered on their application. Applicants should also describe this choice in their statement of purpose.
- Being admitted to The Graduate School does not imply that you will receive financial assistance of any kind. The awarding of financial assistance is a separate decision.

Questions

Consult the Graduate School’s application instructions (http://gradschool.unc.edu/admissions/instructions.html) or contact gradinfo@unc.edu.

Statement of Purpose

To assist in the evaluation of your application, please provide a concise personal statement including the following information.

- Why do you wish to pursue graduate study in pharmaceutical sciences?
- Why do you wish to engage in graduate study in this institution?
- What are your reasons for selecting your first choice of division (i.e. area of interest or specialization)?
- What do you offer that will enrich our graduate program? Please include factors such as:
  - Work, teaching, or other life experiences
  - Meaningful events that have influenced your life and career choices
  - Communication abilities
- Problem-solving skills
- Are you a leader, follower, or team player?
- History of overcoming challenges or disadvantages
- Cultural diversity (this may include ethnic background, race, and other attributes that define your cultural background)
- If possible, please identify the specific research areas in which you plan to focus your graduate studies. Is there a particular faculty member with whom you would like to work?

Admission to the M.S. Program

Applicants to the master’s program must meet both of the following requirements:

1. Be a licensed pharmacist in the U.S.
2. Hold a Doctor of Pharmacy (Pharm.D.) or the equivalent

Everything detailed below must be completed prior to the deadline for your application to be considered.

Interested applicants will need to apply to the University of North Carolina Graduate School for their didactic component. The applicant will also need to complete separate applications for each residency program to which they wish to apply — UNC Hospitals, Duke University Health System, Wake Forest Baptist Hospital, Mission Health in Asheville, or Moses Cone in Greensboro. Applicants need only to apply to their residency programs of interest.

Individual interview days will be scheduled at times convenient for applicants and institutions. Each applicant and program will communicate to identify the ideal time to conduct the interview. Our hope is to have all of the interviews for an applicant in one consecutive period.

Each program will participate in the match, but each one has a different match number. If you have not done so already, please make sure to register for the National Matching Service offered through ASHP. Currently there are four positions available at UNC, one at Duke, two at Wake Forest, one at Mission Health and one at Moses Cone for a total of nine per cohort.

Application Procedures

- Complete a Graduate School application for admission (see link below)
- Create an online account
- Fill out the application information as follows:
  - Level of Study: Graduate
  - Type of Applicant: New degree-seeking applicant
  - Major: Pharmaceutical Sciences
  - Degree: Master of Science
  - Area of Interest or Specialization: Practice Advancement and Clinical Education
  - Select the term of entry
  - Fill out the applicant information
  - Fill out educational background
  - Upload your unofficial transcripts — undergraduate and graduate
  - Upload a statement of purpose
  - GREs are waived for applicants with a Pharm.D. degree and a GPA greater than 3.0*
  - Upload a copy of your CV/resume
  - Submit the application and pay the non-refundable $85 application fee
  - Provide three letters of recommendation (may be identical to those provided for the residency program application) using the recommendations link on the online application under “Important Links”
  - Have your graduate and undergraduate school submit an official academic transcript for each school attended. The graduate school will request official transcripts after acceptance into the program only.

* Please note: The GRE waiver applies to applicants possessing a Pharm.D. with a GPA greater than 3.0. Qualified applicants may submit an online application without entering this standardized test score. Although your application status may show “incomplete,” this status will not be held against you at the time of review, and the waiver will be honored if you are offered admission to our M.S. program.

Graduate Assistantships and Fellowships in the UNC Eshelman School of Pharmacy

Research assistantships in the UNC Eshelman School of Pharmacy provide a competitive stipend, health insurance, tuition, and fees for 12 months’ service. All awards are made on a competitive basis with considerable consideration given to the applicant’s academic record and research experience. Information concerning these assistantships, fellowships, and traineeships may be obtained by writing directly to the Office of Research and Graduate Education at the UNC Eshelman School of Pharmacy.

Chemical Biology and Medicinal Chemistry

Chemical biology and medicinal chemistry are multidisciplinary fields that integrate organic chemistry, biochemistry, molecular biology, structural biology, pharmacology, and physiology. The research in the division applies and extends the basic concepts of chemistry, biochemistry, and pharmacology to the investigation of biomedical problems. General areas of study include structure-activity relationships, drug-receptor interactions, synthetic drug design, and target discovery and validation. Specific focus areas include cancer chemotherapy, computer-aided drug design, enzymology, glycochemistry, molecular modeling, natural products, neurochemistry, parasitology, and structural biology.

Pharmacoengineering and Molecular Pharmaceutics

Pharmacoengineering and molecular pharmaceutics represents interdisciplinary specialties encompassing a range of scientific endeavors, including the design, fabrication, evaluation, use of, and delivery strategies for dosage forms; elucidation of the behavior of pharmacologic agents in biologic systems; determination of the ability of pharmacologic agents to reach the relevant site of biologic effect; and determination of the time course of biologic activity.

These areas of specialization represent critical steps in the development of new therapeutic agents, the evaluation of new and existing drugs, and the optimal clinical use of pharmacologic agents.

Students in the Division of Pharmacoengineering and Molecular Pharmaceutics are required to participate in a common core of entry-level graduate courses. This core provides a broad perspective of the pharmaceutical sciences as well as an appreciation for how different
subdisciplines interact. Many dissertation projects are collaborative in nature and rely upon interactions with faculty in other divisions of the UNC Eshelman School of Pharmacy, as well as with colleagues in the UNC School of Medicine, the Department of Chemistry, or at pharmaceutical companies or institutions located in the Research Triangle Park area.

Pharmaceutical Outcomes and Policy
The Division of Pharmaceutical Outcomes and Policy offers a Ph.D. program in pharmaceutical sciences emphasizing an interdisciplinary approach to addressing issues relevant to medication use at the patient, provider, community, and societal levels. Faculty research interests and course offerings reflect this interdisciplinary orientation. Students develop knowledge and skills that enable them to conduct high quality research directed at improving the use and cost effectiveness of medications, technology, and services. Education and research in the division draws heavily upon expertise in numerous fields such as health services research, health policy, health communication, health behavior and behavior change, epidemiology, and psychometrics. Areas of faculty and student research include communication and decision making, comparative effectiveness of medications and pharmacy practice models, medication adherence and self-management, health disparities, health literacy, patient reported outcomes assessment, pharmaceutical policy analysis, and policy and ethical issues related to pharmacogenomics.

Pharmacotherapy and Experimental Therapeutics
The Division of Pharmacotherapy and Experimental Therapeutics offers a Ph.D. program in the pharmaceutical sciences with a focus on translational research that integrates biomedical and pharmaceutical sciences in both laboratory-based models and in humans. The goal of the program is to develop scientists who are prepared to generate and disseminate new knowledge in pharmacotherapy and accelerate its application to improve patient care. Graduate students engage in clinical experiences throughout the program that are designed to complement each student’s research interests while also facilitating their development as translational scientists. Areas of graduate coursework and research include drug metabolism and transport, pharmacokinetics/pharmacodynamics/pharmacometrics, pharmacogenomics, clinical research, drug development, experimental therapeutics, and mechanisms of drug toxicity. Therapeutic and research areas of particular strength include cardiovascular disease, infectious disease/HIV, oncology/hematology, hepatology/gastroenterology/transplant, and pulmonary disease.

Master of Science in Pharmaceutical Sciences
The Eshelman School of Pharmacy offers a master of science in pharmaceutical sciences with a specialization in health-systems pharmacy.

The M.S. program prepares future health care leaders to manage highly complex and multifaceted pharmacy enterprise operations. To accomplish this goal, the program provides students with the knowledge, skills, and experience necessary to assume a variety of roles and responsibilities. Graduates serve as vibrant, committed professionals with a focus on improving patients’ health, health care delivery, and the profession of pharmacy. This occurs through both didactic education and experiential opportunities in class and in the workplace.

The residential M.S. program is designed for full-time students with a Pharm.D. degree who are seeking residency training experience.

The fully online M.S. program is designed for working professionals with a pharmacy degree who want to secure their degree while working.

Distinguished Professors
Jeffrey Aube, Center for Integrative Chemical Biology and Drug Discovery (CICBDD)
Kim Brouwer, Pharmacotherapy and Experimental Therapeutics
Stefanie Ferreri, Practice Advancement
Stephen Frye, Center for Integrative Chemical Biology and Drug Discovery (CICBDD)
Leaf Huang, Pharmacoengineering and Molecular Pharmaceutics
Michael Jay, Pharmacoengineering and Molecular Pharmaceutics
Alexander Kabanov, Center for Nanotechnology in Drug Discovery (CNDD)
David Lawrence, Chemical Biology and Medicinal Chemistry
Kuo-Hsiung Lee, Chemical Biology and Medicinal Chemistry
Jian Liu, Chemical Biology and Medicinal Chemistry
Denise Rhoney-Metzger, Practice Advancement
Betsy Sleath, Pharmaceutical Outcomes and Policy
Alexander Tropsha, Chemical Biology and Medicinal Chemistry

Professor of the Practice
John Bamforth, Eshelman Institute for Innovation
Jon Easter, Practice Advancement
Anthony Hickey, UNC Catalyst for Rare Disease
Stephanie Kiser, Practice Advancement

Professors
Kristy Ainslie, Pharmacoengineering and Molecular Pharmaceutics
Jennifer Elston-Lafata, Pharmaceutical Outcomes and Policy
Timothy Ives, Practice Advancement
Andrew Lee, Chemical Biology and Medicinal Chemistry
Mary McClurg, Practice Advancement
James H. Patterson, Pharmacotherapy and Experimental Therapeutics
Paul Watkins, Pharmacotherapy and Experimental Therapeutics

Associate Professors
Albert Bowers, Chemical Biology and Medicinal Chemistry
Delesha Carpenter, Pharmaceutical Outcomes and Policy
Gang Fang, Pharmaceutical Outcomes and Policy
Daniel Gonzalez, Pharmacotherapy and Experimental Therapeutics
Nathaniel Hathaway, Chemical Biology and Medicinal Chemistry
Erin Heiznen Cox, Pharmacotherapy and Experimental Therapeutics
Shawn Hingtgen, Pharmacoengineering and Molecular Pharmaceutics
Federico Innocenti, Pharmacotherapy and Experimental Therapeutics
Michael Jarstfer, Chemical Biology and Medicinal Chemistry
Samuel Lai, Pharmacoengineering and Molecular Pharmaceutics
Craig Lee, Pharmacotherapy and Experimental Therapeutics
Rihe Liu, Chemical Biology and Medicinal Chemistry
Jacqueline McLaughlin, Practice Advancement
Juliane Nguyen, Pharmacoengineering and Molecular Pharmaceutics
Sachiko Ozawa, Practice Advancement
Robert Shrewsby, Practice Advancement
Scott Singleton, Chemical Biology and Medicinal Chemistry
Philip Smith, Pharmacoengineering and Molecular Pharmaceutics
Kathleen Thomas, Pharmaceutical Outcomes and Policy
Carolyn Thorpe, Pharmaceutical Outcomes and Policy
Joshua Thorpe, Pharmaceutical Outcomes and Policy
Dennis Williams, Pharmaco therapy and Experimental Therapeutics  
Timothy Wiltshire, Pharmaco therapy and Experimental Therapeutics  
William Zamboni, Pharmaco therapy and Experimental Therapeutics  
Qisheng Zhang, Chemical Biology and Medicinal Chemistry  

Assistant Professors  
Aaron Anselmo, Pharmacoengineering and Molecular Pharmaceutics  
Yanguang Cao, Pharmaco therapy and Experimental Therapeutics  
Daniel Crona, Pharmaco therapy and Experimental Therapeutics  
Julie Dumond, Pharmaco therapy and Experimental Therapeutics  
Klarissa Jackson, Pharmaco therapy and Experimental Therapeutics  
Lindsey James, Chemical Biology and Medicinal Chemistry  
Alan Kinlaw, Pharmaceutical Outcomes and Policy  
Robert McGinty, Chemical Biology and Medicinal Chemistry  
Gauri Rao, Pharmaco therapy and Experimental Therapeutics  
Megan Roberts, Pharmaceutical Outcomes and Policy  
Amenda Seyerle, Pharmaceutical Outcomes and Policy  
Casey Tak, Pharmaceutical Outcomes and Policy  

Research Professors  
Dmitri Kireev, Center for Integrative Chemical Biology and Drug Discovery (CICBDD)  
Susan Morris-Natschke, Chemical Biology and Medicinal Chemistry  
Kenneth Pearce Jr., Center for Integrative Chemical Biology and Drug Discovery (CICBDD)  
Xiaodong Wang, Center for Integrative Chemical Biology and Drug Discovery (CICBDD)  
Timothy Willson, Structural Genomics Consortium  

Research Associate Professors  
Eric Bachelder, Pharmacoengineering and Molecular Pharmaceutics  
Elena Batrakova, Center for Nanotechnology in Drug Discovery (CNDD)  
David Drewry, Structural Genomics Consortium  
Robert Hubal, Practice Advancement  
Juan Li, Pharmacoengineering and Molecular Pharmaceutics  
Ievgen Muratov, Chemical Biology and Medicinal Chemistry  
Samantha Pattenden, Center for Integrative Chemical Biology and Drug Discovery (CICBDD)  
Elias Rosen, Pharmaco therapy and Experimental Therapeutics  
Marina Sokolsky-Papkov, Pharmacoengineering and Molecular Pharmaceutics  
Yongmei Xu, Chemical Biology and Medicinal Chemistry  

Research Assistant Professors  
Katelyn Arnold, Chemical Biology and Medicinal Chemistry  
Alison Axtman, Structural Genomics Consortium  
Jacqueline Bezencon, Pharmaco therapy and Experimental Therapeutics  
Carrie Blanchard, Center for Medication Optimization (CMO)  
Rachel Church, Pharmaco therapy and Experimental Therapeutics  
Mackenzie Cottrell, Pharmaco therapy and Experimental Therapeutics  
Anita Crescenzi, Practice Advancement  
Scott Davis, Pharmaceutical Outcomes and Policy  
Yury Desyaterik, Pharmaco therapy and Experimental Therapeutics  
Kevin Frankowski, Center for Integrative Chemical Biology and Drug Discovery (CICBDD)  
Dong Fu, Pharmaco therapy and Experimental Therapeutics  
Masuo Goto, Chemical Biology and Medicinal Chemistry  
Lauren Haar, Chemical Biology and Medicinal Chemistry  
Jine Li, Chemical Biology and Medicinal Chemistry  
Melanie Livet, Center for Medication Optimization (CMO)  
Matthew Loop, Pharmaco therapy and Experimental Therapeutics  
Andrew Lucas, Pharmaco therapy and Experimental Therapeutics  
Merrie Mosedale, Pharmaco therapy and Experimental Therapeutics  
Jillian Perry, Center for Nanotechnology in Drug Discovery (CNDD)  
Paul Sapienza, Chemical Biology and Medicinal Chemistry  
Junjiang Sun, Pharmacoengineering and Molecular Pharmaceutics  
Benjamin Urick, Center for Medication Optimization (CMO)  
Qunzhao Wang, Chemical Biology and Medicinal Chemistry  
Bin Xiao, Pharmacoengineering and Molecular Pharmaceutics  

Clinical Professors  
Robert Dupuis, Pharmaco therapy and Experimental Therapeutics  
Adam Persky, Pharmaco therapy and Experimental Therapeutics  
Jo Ellen Rodgers, Pharmaco therapy and Experimental Therapeutics  
John Greene Shepherd, Practice Advancement  

Clinical Associate Professors  
Amanda H. Corbett, Pharmaco therapy and Experimental Therapeutics  
Wendy Cox, Practice Advancement  
Stephen Eckel, Practice Advancement  
Macary Marciniak, Practice Advancement  
Nicole Pinelli Reitter, Practice Advancement  
Philip Rodgers, Practice Advancement  
Mollie Scott, Practice Advancement  
Deborah Sturpe, Pharmaco therapy and Experimental Therapeutics  

Clinical Assistant Professors  
Heidi Ankorsus, Practice Advancement  
Amber Frick, Pharmaco therapy and Experimental Therapeutics  
Kathryn Fuller, Practice Advancement  
Jessica Greene, Pharmacoengineering and Molecular Pharmaceutics  
Suzanne Harris, Practice Advancement  
Kathryn Morbitzer, Practice Advancement  
Benym Muluneh, Pharmaco therapy and Experimental Therapeutics  
Kimberly Sanders, Practice Advancement  
Amanda Savage, Practice Advancement  
David Steeb, Practice Advancement  
Carla White, Practice Advancement  
Charlene Williams, Practice Advancement  
Jacqueline Zeeman, Practice Advancement  

Subjects in this school include: Chemical Biology and Medicinal Chemistry (CBMC) (p.), Pharmacoengineering and Molecular Pharmaceutics (DPMP) (p.), Pharmaco therapy and Experimental Therapeutics (DPET) (p.), Practice Advancement and Clinical Education (PACE) (p.), Pharmaceutical Outcomes and Policy (DPOP) (p.), and Pharmaceutical Sciences (PHRS) (p.).  

Note that the courses listed below are not listed in the order and number of times that they must be completed. See the program's Web site for more detailed information about the sequence of courses and credit hour totals. The program's Web site also provides information about concentrations.  

Chemical Biology and Medicinal Chemistry  

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>CBMC 807</td>
<td>Foundations of Chemical Biology I: Organic and Medicinal Chemistry</td>
<td>3</td>
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</table>
### Pharmacology and Molecular Pharmaceutics

**Non-Clinician Track**

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<tr>
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<tbody>
<tr>
<td>DPET 833</td>
<td>Experimental Design Considerations in Clinical Research</td>
<td>2</td>
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<tr>
<td>DPET 853</td>
<td>PK Module 1: Pharmacokinetic Concepts and Applications</td>
<td>1.75</td>
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<tr>
<td>DPET 854</td>
<td>PK Module 2: Pharmacodynamic Concepts and Applications</td>
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</tr>
<tr>
<td>DPET 873</td>
<td>Precision Therapeutics Through Genomics</td>
<td>3</td>
</tr>
<tr>
<td>DPET 841</td>
<td>Science and Methods in Drug Development</td>
<td>2</td>
</tr>
<tr>
<td>DPET 856</td>
<td>Advanced Pharmacokinetics and Pharmacodynamics</td>
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<tr>
<td>DPET 857</td>
<td>PK Module 3: Population PK/PD Analysis</td>
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<tr>
<td>DPMP 815</td>
<td>Drug Metabolism</td>
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<tr>
<td>PHRS 899</td>
<td>Seminar in Pharmaceutical Sciences</td>
<td>1</td>
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<tr>
<td>PHRS 991</td>
<td>Research in Pharmaceutical Sciences</td>
<td>1-9</td>
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<tr>
<td>PHRS 994</td>
<td>Doctoral Research and Dissertation</td>
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**Clinician Track**

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<tr>
<td>DPET 873</td>
<td>Precision Therapeutics Through Genomics</td>
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<td>DPET 833</td>
<td>Experimental Design Considerations in Clinical Research</td>
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<tr>
<td>DPET 854</td>
<td>PK Module 1: Pharmacokinetic Concepts and Applications</td>
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<td>PK Module 2: Pharmacodynamic Concepts and Applications</td>
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<td>DPET 858</td>
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<td>DPET 841</td>
<td>Science and Methods in Drug Development</td>
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<tr>
<td>PHRS 801</td>
<td>Foundations for Cross-Disciplinary Training in the</td>
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<tr>
<td>DPMP 815</td>
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*Approved elective courses (6)*

### Pharmacoengineering and Molecular Pharmaceutics

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<td>PHRS 801</td>
<td>Foundations for Cross-Disciplinary Training in the</td>
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<td>Pharmaceutical Sciences</td>
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<tr>
<td>DPMP 738</td>
<td>Nanomedicine</td>
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<td>DPMP 862</td>
<td>Advanced Physical Pharmacy</td>
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<tr>
<td>DPMP 863</td>
<td>Advanced Pharmaceutics II</td>
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<tr>
<td>DPMP 864</td>
<td>Advances in Drug Delivery</td>
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<tr>
<td>DPET 853</td>
<td>PK Module 1: Pharmacokinetic Concepts and Applications</td>
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<td>DPMP 815</td>
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<td>PHRS 991</td>
<td>Research in Pharmaceutical Sciences</td>
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<tr>
<td>PHRS 994</td>
<td>Doctoral Research and Dissertation</td>
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### Pharmaceutical Outcomes and Policy

<table>
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<tbody>
<tr>
<td>DPOP 803</td>
<td>Social and Behavioral Aspects of Pharmaceutical Use</td>
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<td>DPOP 806</td>
<td>Pharmaceutical Policy</td>
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<tr>
<td>DPOP 872</td>
<td>Proposal Writing in DPOP</td>
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<td>DPOP 870</td>
<td>Pharmaceutical Outcomes Research</td>
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<td>EPID 710</td>
<td>Fundamentals of Epidemiology</td>
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<tr>
<td>EPID 705</td>
<td>Introduction to Deductive and Probability Logic in</td>
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<td></td>
<td>Epidemiology</td>
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<td>EPID 715</td>
<td>Theory and Quantitative Methods in Epidemiology</td>
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<td>EPID 716</td>
<td>Epidemiologic Data Analysis</td>
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<tr>
<td>EPID 765</td>
<td>Methods and Issues in Pharmacoepidemiology</td>
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<td>PHRS 815</td>
<td>Foundations in Implementation Science: Examples in</td>
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<td>Precision Health and Society</td>
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<td>Research in Pharmaceutical Sciences</td>
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<td>PHRS 994</td>
<td>Doctoral Research and Dissertation</td>
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### Practice Advancement and Clinical Education (Master's Program)

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<tbody>
<tr>
<td>PACE 815</td>
<td>Evaluation Research and Project Design</td>
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<tr>
<td>PACE 820</td>
<td>Health-System Pharmacy Leadership</td>
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<tr>
<td>PACE 825</td>
<td>Foundational Practices of a Successful Health-System</td>
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<td>Department of Pharmacy</td>
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<td>PACE 832</td>
<td>Financial Management of Health-system Pharmacy</td>
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<tr>
<td>PACE 833</td>
<td>Overview of Health Systems</td>
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<tr>
<td>PACE 860</td>
<td>Advanced Hospital Pharmacy Operations</td>
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<tr>
<td>PHRS 992</td>
<td>Master’s (Non-Thesis)</td>
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