The School of Pharmacy is dedicated to excellence in pharmacy-related education, research, and service, including the provision of patient care. We seek to prepare students with knowledge, skills, and values for careers in pharmacy practice and the pharmaceutical sciences. Our programs promote intellectual growth, professionalism, and lifelong learning. Through the generation and dissemination of new knowledge and through scholarship and community service, the school contributes to improved individual and population health.

**Programs**

**Doctor of Philosophy (PhD)**
- Biomedical Sciences (http://catalog.northeastern.edu/graduate/health-sciences/pharmacy/biomedical-sciences-phd)
- Medicinal Chemistry (http://catalog.northeastern.edu/graduate/health-sciences/pharmacy/medicinal-chemistry-phd)
- Pharmaceutical Sciences (http://catalog.northeastern.edu/graduate/health-sciences/pharmacy/pharmaceutical-sciences-phd)
- Pharmacology (http://catalog.northeastern.edu/graduate/health-sciences/pharmacy/pharmacology-phd)

**Doctor of Pharmacy (PharmD)**
- Doctor of Pharmacy (http://catalog.northeastern.edu/graduate/health-sciences/pharmacy/pharmd)
- Doctor of Pharmacy—Direct Entry (http://catalog.northeastern.edu/graduate/health-sciences/pharmacy/pharmd-direct-entry)

**Master of Science (MS)**
- Biomedical Nanotechnology (http://catalog.northeastern.edu/graduate/health-sciences/pharmacy/biomedical-nanotechnology-ms)
- Biomedical Sciences (http://catalog.northeastern.edu/graduate/health-sciences/pharmacy/biomedical-sciences-ms)
- Medicinal Chemistry (http://catalog.northeastern.edu/graduate/health-sciences/pharmacy/medicinal-chemistry-ms)
- Pharmaceutical Sciences (http://catalog.northeastern.edu/graduate/health-sciences/pharmacy/pharmaceutical-sciences-ms)
- Pharmacology (http://catalog.northeastern.edu/graduate/health-sciences/pharmacy/pharmacology-ms)

**Courses**

**Pharmacy Practice Courses**

**PHMD 5223. Evidence-Based Medicine. 2 Hours.**
Studies the principles of evidence-based medicine and how to apply them to patient-centered care. Offers students an opportunity to develop skills in critical appraisal of the scientific literature and practical application of the evidence to clinical decision making. Consists of didactic instruction, in-class group projects, and a group-based written assignment. Applies principles of research methodology, biostatistics, and professional writing.

**PHMD 5250. Pharmacy Care Management. 3 Hours.**
Focuses on the managerial and administrative skills required by a contemporary pharmacist practicing in either a community or hospital setting. Covers classical management principles of planning, decision making, organizing, hiring, and controlling. Case study methods are used as an interactive teaching tool. Also covers pertinent current events.

**PHMD 5270. Economic Evaluation of Pharmaceuticals and Pharmacy Practice. 2 Hours.**
Introduces the principles of economic theory of healthcare markets and economic evaluation of health products and services. Economic theory topics include fundamentals of supply and demand, market structure, market failure, and the role of government. Economic evaluation topics include measuring costs and benefits of a specific treatment, types of formal decision analysis, ethical considerations, and implementation in the real world. Restricted to students with fifth-year PharmD standing.

**PHMD 5330. Jurisprudence. 3 Hours.**
Covers all federal and state laws and regulations that affect the practice of pharmacy. Discusses sources of law including the U.S. Constitution, statutes, administrative regulations, and case law. Introduces federal and state administrative agencies that regulate pharmacy, including the Drug Enforcement Administration (DEA), Food and Drug Administration (FDA), Consumer Products Safety Commission (CPSC), Massachusetts Board of Registration in Pharmacy, and Massachusetts Department of Public Health. Requires students to research a pharmacy case decided by a court and give an oral presentation. Centers on the individuals who operate a pharmacy; pharmacists, pharmacy technicians, and pharmacy interns; their workplaces: pharmacy, pharmacy department, hospital, restricted pharmacy, managed care, nuclear pharmacy, and wholesale businesses; and duties performed by pharmacy personnel: dispensing medication and counseling patients.

**PHMD 5438. Advanced Pharmacy Practice Experience Preparatory Seminar 1. 0.5 Hours.**
Seeks to provide relevant information to enable fifth-year students to make informed decisions concerning the selection and completion of the advance pharmacy practice experiences (APPEs). Using the professional portfolio as a catalyst for exploration, students are required to examine and discuss the variety of APPEs offered. The review of APPE types includes utilizing effective strategies to identify appropriate APPE selections. Students are guided by faculty on how to make APPE selections based on student-identified professional career goals.
PHMD 5439. Advanced Pharmacy Practice Experience Preparatory Seminar 2. 0.5 Hours.
Designed to provide students with opportunities to apply concepts from PHMD 6438 and to continue to provide relevant information to enable fifth-year students to make informed decisions concerning the selection and completion of the advanced pharmacy practice experiences (APPEs). Seeks to provide new knowledge and strengthen existing knowledge to ensure a smooth transition from the didactic courses to APPEs.

PHMD 5450. Advanced Pharmacy Practice Experience Preparatory Seminar. 1 Hour.
Offers students an opportunity to collect relevant information to make informed decisions concerning the selection of advanced pharmacy practice experiences (APPEs). Designed to provide new knowledge (e.g., what is expected of a P4 student) and to strengthen existing knowledge (e.g., from didactic courses) to offer a smooth transition from the didactic courses to APPEs.

PHMD 5575. Pharmaceutical Industry. 2 Hours.
Offers a global overview of pharmaceutical industry career options and pathways. Focuses on all major functions of the industry, such as clinical research and medical affairs. Additional areas covered include regulatory affairs, health economic and outcomes research, marketing, sales, scientific liaisons, and pharmacovigilance. Explores the phases of drug development and how these phases interact with different departments.

PHMD 5600. Pharmacy Capstone. 4 Hours.
Acts as a final integrator of the major, general education, and experiential aspects of the student's education. Expects students to demonstrate motivation and initiative and to work cooperatively with their faculty mentor, community partners, and fellow students (where applicable) in order to complete a comprehensive, high-quality scholarly work (e.g., a research project, educational project, administrative project, business plan, case report, or community-service learning project or professional manuscript) appropriate for dissemination to the university and professional community. The timeline for completion is set by the faculty mentor and agreed to by the individual or all members of the student group. May be repeated once.

PHMD 5675. Ambulatory Care Pharmacy Practice in Urban Health. 2 Hours.
Introduces various aspects of ambulatory care pharmacy practice and social, economic, cultural, and psychological intricacies. Covers chronic disease management and prevention and wellness. Offers students an opportunity to gain insight into the pharmacist's role as part of a patient-centered medical home model and/or an interdisciplinary primary care team, with an emphasis on urban health. Requires students to be enrolled in the third professional year of the pharmacy curriculum and to apply and be approved by the course coordinators through an application process. Criteria to be considered include, but are not limited to, grades of B or better in PHMD 4611, PHMD 4612, PHMD 4621, and PHMD 4622.

PHMD 5880. Special Topics. 2,3 Hours.
Explores topics germane to medication and medication use, as established by the course instructor.

PHMD 5900. Self-Care and Nonprescription Medications: A Team-Based Approach. 2 Hours.
Focuses on the clinical use, safety, and efficacy of common nonprescription medications and complementary alternatives (vitamins, minerals, supplements, herals, etc.) used in the outpatient setting to treat minor medical problems. Pharmacists are often approached by members of the community to recommend treatments for common ailments. It is important for pharmacists to quickly and accurately assess patients to determine if they are candidates for self-care or if a referral to another healthcare provider is warranted. Offers students an opportunity to develop the necessary skills to determine if self-care treatment is an option for patients and to make appropriate self-care and nonprescription product selection recommendations based on the assessment of a patient's health status, medical problems, and current practice of self-treatment through case-based examples.

PHMD 5976. Directed Study. 1-4 Hours.
Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. May be repeated for up to 4 total credits.

PHMD 5984. Research. 1-4 Hours.
Offers an opportunity to conduct research under faculty supervision. May be repeated without limit.

PHMD 6440. Internal Medicine Advanced Pharmacy Practice Experience. 6 Hours.
Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patients in the hospital setting. In collaboration with other members of the healthcare team, and under the supervision of a clinical preceptor, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients.

PHMD 6441. Acute Care Advanced Pharmacy Practice Experience. 6 Hours.
Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patients in collaboration with other members of the healthcare team, and under the supervision of a clinical preceptor, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients.

PHMD 6442. Ambulatory Care Advanced Pharmacy Practice Experience. 6 Hours.
Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patients in an ambulatory clinic environment. In collaboration with other members of the healthcare team, and under the supervision of a clinical preceptor, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients.

PHMD 6443. Community Advanced Pharmacy Practice Experience. 6 Hours.
Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patients in a community setting. In collaboration with other members of the healthcare team, and under the supervision of a clinical preceptor, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients.
PHMD 6444. Internal Medicine Elective Advanced Pharmacy Practice Experience. 6 Hours.
Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patients in the hospital setting. In collaboration with other members of the healthcare team, and under the supervision of a clinical preceptor, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. May be repeated without limit.

PHMD 6445. Ambulatory Care Elective Advanced Pharmacy Practice Experience. 6 Hours.
Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patients in an ambulatory clinic environment. In collaboration with other members of the healthcare team, and under the supervision of a clinical preceptor, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. May be repeated without limit.

PHMD 6446. Psychiatry Advanced Pharmacy Practice Experience. 6 Hours.
Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patients under psychiatric care. In collaboration with other members of the healthcare team, and under the supervision of a clinical preceptor, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. May be repeated without limit.

PHMD 6447. Community Elective Advanced Pharmacy Practice Experience. 6 Hours.
Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patients in a community setting. In collaboration with other members of the healthcare team, and under the supervision of a clinical preceptor, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. May be repeated without limit.

PHMD 6448. Long Term Care Advanced Pharmacy Practice Experience. 6 Hours.
Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patients in a nursing home or rehabilitation center. Under the supervision of a clinical preceptor and, when appropriate, in conjunction with other members of the healthcare team, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. May be repeated without limit.

PHMD 6449. Geriatrics Advanced Pharmacy Practice Experience. 6 Hours.
Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patients in a geriatric practice setting. Under the supervision of a clinical preceptor, and, when appropriate, in conjunction with other members of the healthcare team, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. May be repeated without limit.

PHMD 6450. Pediatrics Advanced Pharmacy Practice Experience. 6 Hours.
Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patients in a pediatric practice setting. Under the supervision of a clinical preceptor, and, when appropriate, in conjunction with other members of the healthcare team, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. May be repeated without limit.

PHMD 6451. Neonatology Advanced Pharmacy Practice Experience. 6 Hours.
Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patients in a neonatal practice setting. Under the supervision of a clinical preceptor, and, when appropriate, in conjunction with other members of the healthcare team, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. May be repeated without limit.

PHMD 6452. Critical Care Advanced Pharmacy Practice Experience. 6 Hours.
Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patients in a critical-care practice setting. Under the supervision of a clinical preceptor, and, when appropriate, in conjunction with other members of the healthcare team, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. May be repeated without limit.

PHMD 6453. Surgery Advanced Pharmacy Practice Experience. 6 Hours.
Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patients in a surgical practice setting. Under the supervision of a clinical preceptor, and, when appropriate, in conjunction with other members of the healthcare team, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. May be repeated without limit.
PHMD 6454. Cardiology Advanced Pharmacy Practice Experience. 6 Hours.
Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patients in a cardiology practice setting. Under the supervision of a clinical preceptor, and, when appropriate, in conjunction with other members of the healthcare team, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. May be repeated without limit.

PHMD 6455. Pharmacokinetics Advanced Pharmacy Practice Experience. 6 Hours.
Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patients on a pharmacokinetic consult service. Under the supervision of a clinical preceptor, and, when appropriate, in conjunction with other members of the healthcare team, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. May be repeated without limit.

PHMD 6456. Drug Information Advanced Pharmacy Practice Experience. 6 Hours.
Applies drug information skills to site-specific drug information requests under the supervision of a clinical preceptor, and, when appropriate, in conjunction with other members of the site team. Using appropriate sources, the student analyzes drug information findings, such as dosing, monitoring, indications, efficacy, and adverse drug reactions. May be repeated without limit.

PHMD 6457. Oncology Advanced Pharmacy Practice Experience. 6 Hours.
Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patients in an oncology practice setting. Under the supervision of a clinical preceptor, and, when appropriate, in conjunction with other members of the healthcare team, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. May be repeated without limit.

PHMD 6458. Drug Utilization Advanced Pharmacy Practice Experience. 6 Hours.
Identifies topics and design of methodology for drug-use evaluation as well as completion of data collection, data evaluation, and presentation of results under the supervision of a clinical preceptor, and, when appropriate, in conjunction with other members of the healthcare team. May be repeated without limit.

PHMD 6459. Home Health Advanced Pharmacy Practice Experience. 6 Hours.
Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patients in a home healthcare practice setting. Under the supervision of a clinical preceptor, and, when appropriate, in conjunction with other members of the healthcare team, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. May be repeated without limit.

PHMD 6460. Nutritional Support Advanced Pharmacy Practice Experience. 6 Hours.
Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patients on a nutritional support consult service. Under the supervision of a clinical preceptor, and, when appropriate, in conjunction with other members of the healthcare team, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. May be repeated without limit.

PHMD 6461. Infectious Disease Advanced Pharmacy Practice Experience. 6 Hours.
Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patients on an infectious disease consult service. Under the supervision of a clinical preceptor, and, when appropriate, in conjunction with other members of the healthcare team, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. May be repeated without limit.

PHMD 6462. Pharmacy Industry Advanced Pharmacy Practice Experience. 6 Hours.
Focuses on the application of regulatory affairs and healthcare principles in the pharmaceutical industry. Under the supervision of a preceptor, and, when appropriate, in conjunction with other members of the site team, participates in appropriate activities, such as drug research and development, marketing, medical affairs, regulatory affairs, and information service. May be repeated without limit.

PHMD 6463. Pharmacy Administration Advanced Pharmacy Practice Experience. 6 Hours.
Applies healthcare and management principles, with emphasis on pharmacy administration, under the supervision of a preceptor, and, when appropriate, in conjunction with other members of the site team. May be repeated without limit.

PHMD 6464. Regulatory Advanced Pharmacy Practice Experience. 6 Hours.
Participates in appropriate activities including but not limited to principles of and compliance with pharmacy law and review of regulations governing the FDA’s mandatory reporting of adverse drug reactions under the supervision of a preceptor, and, when appropriate, in conjunction with other members of the site team. In addition, students may have the opportunity to be given a step-by-step introduction to public record laws, Board Regulations at 247 CMR, and pharmacy statutes at Massachusetts General Laws, Chapter 112, 24(A)–42(A). May be repeated without limit.

PHMD 6465. Managed Care Advanced Pharmacy Practice Experience. 6 Hours.
Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patients in a managed-care practice setting. Under the supervision of a clinical preceptor, and, when appropriate, in conjunction with other members of the healthcare team, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. May be repeated without limit.
PHMD 6466. Transplantation Advanced Pharmacy Practice Experience. 6 Hours.
Applies principles of pathophysiology, therapeutics, and communication to the pharmacy-care management of individual patients in a transplantation unit. Under the supervision of a clinical preceptor, and, when appropriate, in conjunction with other members of the healthcare team, offers identification of appropriate drug therapy and monitoring requirements for common pathophysiologic processes, and, when indicated, modification of population-based treatment strategies based on the unique characteristics of individual patients. May be repeated without limit.

PHMD 6467. Directed Practice Advanced Pharmacy Practice Experience. 6 Hours.
Offers nontraditional experience with an approved preceptor at an appropriate site. Based on availability. May be repeated without limit.

PHMD 6468. International Advanced Pharmacy Practice Experience. 6 Hours.
Provides an international experience with an approved preceptor at an appropriate site. Based on availability. May be repeated without limit.

PHMD 6469. Management Advanced Pharmacy Practice Experience. 6 Hours.
Offers students an opportunity to apply healthcare and management principles, with an emphasis on pharmacy management, under the supervision of a preceptor and, when appropriate, in conjunction with other members of the site management team. May be repeated up to two times.

PHMD 6470. Education Advanced Pharmacy Practice Experience. 6 Hours.
Offers students an opportunity to teach in the pharmacy curriculum under the supervision of a faculty member. Students have an opportunity to examine how teachers use experience-based and problem-based approaches to engage the range of student learners (third- through fifth-year pharmacy students) to attain their learning goals. May be repeated up to two times.

PHMD 6471. Research 1 Advanced Pharmacy Practice Experience. 6 Hours.
Offers students interested in gaining basic or clinical research experience an opportunity to work under the direction of an experienced researcher at an appropriate site. Students can elect either a basic science (lab-based) preceptor or a clinical (patient-based) preceptor. Students can expect to be an active participant in a variety of different research activities and experiences that are deemed appropriate by the preceptor. The research efforts of the student may result in a peer-reviewed research abstract and/or presentation. May be repeated up to two times.

PHMD 6472. Research 2 Advanced Pharmacy Practice Experience. 6 Hours.
Offers students an opportunity to further develop research skills and experience gained in PHMD 6471. Intended for those students interested in pursuing a postgraduate research training program (e.g., fellowship or graduate school). The research efforts of the student in the course may result in authorship opportunities on a peer-reviewed research abstract and/or manuscript. May be repeated up to two times.

PHMD 6473. Radiopharmacy Advanced Pharmacy Practice Experience. 6 Hours.
Offers students an opportunity to examine the application of radiopharmaceuticals in medical imaging methods. Includes but is not limited to computed tomography (CT), magnetic resonance imaging (MRI), positron emission tomography (PET), and single-photon tomography (SPECT). Students completing this course may cover aspects of product preparation, administration, and data interpretation. May be repeated up to two times.

PHMD 6474. Public Health Advanced Pharmacy Practice Experience. 6 Hours.
Offers students an opportunity to apply knowledge of public health and policy skills to site-specific needs to advance pharmacy practice within the health system. Seeks to increase knowledge in the principles of public health, with opportunities to work on program implementation and evaluation, policy formation, public health research, and participate in planning and administrative meetings within the public health environment. Offers each student an opportunity to participate as a member of a team to complete group and individual assignments. May be repeated up to two times.

PHMD 6962. Elective. 1-4 Hours.
Offers elective credit for courses taken at other academic institutions. May be repeated without limit.

PHMD 6964. Co-op Work Experience. 0 Hours.
Provides eligible students with an opportunity for work experience. May be repeated without limit.