

## Pharmacy

### Department of Pharmacy Practice

School of Pharmacy and Pharmaceutical Sciences  
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### Overview

*\*This is not a baccalaureate degree program; instead, it is a graduate level doctor of pharmacy (PharmD)*

The doctor of pharmacy degree, also called the PharmD, is an entry-level professional degree that enables one to work as a pharmacist, interacting with patients and other health care practitioners about medications. It is not an undergraduate degree (such as a BS or BA), instead it is a four-year graduate professional degree. An undergraduate degree is not currently required, however, as an admissions prerequisite.

Since 1886, the University at Buffalo School of Pharmacy and Pharmaceutical Sciences (SoPPS) has been a national leader in education and research in both Pharmacy Practice and the Pharmaceutical Sciences. The PharmD program at the University at Buffalo is ranked among the top pharmacy programs in the United States, and is the only program of its kind available in the State University of New York (SUNY) system.

### About our Degrees

Throughout the PharmD professional curriculum, students are expected to be actively involved in the learning process. PharmD students study in settings ranging from large lecture halls to small groups to individual instruction, and they will need to develop critical thinking and problem-solving abilities to assist in providing pharmaceutical-based patient care in many diverse rotational sites.

The pharmacy profession requires practitioners to constantly communicate intricate oral and written information to patients, care providers and other health-care professionals. Effective communication not only requires an ability to use the language fluently and write clearly and concisely, but also requires clear thinking and an awareness of when there is understanding or lack thereof. It is essential that students become active listeners.

Our goal is to provide a strong educational foundation with knowledge, skills and attitudes that enable the graduate to successfully practice as a pharmacist, and to embrace the concept of being a life-long learner.

In addition to the PharmD program, applicants are attracted by the excellence of our basic career tracks (Outpatient Care, Inpatient Care, Clinical Research, and Pharmaceutical Sciences Research) and combined degree programs (PharmD/MBA, PharmD/JD, PharmD/MPH, PharmD/MS and PharmD/PhD) as well as post-graduate residency and fellowship training programs.

The PharmD and combined degree programs include quality staff, students, graduates, and faculty including Distinguished Teaching Professors and recipients of the Chancellor's Awards for Excellence. In a small, personalized community within a major public research university, students are able to experience a close-knit community with their peers and faculty with the resources and facilities of a large research university.

### Acceptance Information

As a renowned center for education and groundbreaking research, admission to the PharmD program is highly competitive. Approximately 125 students are selectively admitted to the program each fall after completion of the pre-pharmacy course requirements. Students who enter UB directly from high school as intended pharmacy majors are automatically eligible for admission into the professional PharmD program after their sophomore or junior year if they adhere to our

[Early Assurance \(EA\) program requirements](#). To be considered for the EA program, students should indicate pharmacy as their intended major either on their initial application or before the end of their first semester at UB. There is no additional paperwork to complete as an incoming freshman. Please note: the University at Buffalo's Office of Undergraduate Admissions is not involved with the EA program; therefore, students will not receive any information regarding this program with their admission decision.

All other applicants are accepted into the program through the Pharmacy College Application Service (PharmCAS) application, which also requires taking the Pharmacy College Admission Test (PCAT) and completing the prerequisite courses as noted below. PharmCAS applicants may complete their prerequisites at UB and then apply to the PharmD program, or they may complete their prerequisites at another accredited institution. While a bachelor's degree is not required, applicants having earned this degree are encouraged to apply. Applicants should apply well in advance to allow ample time to process their applications, as a rolling admissions process is in effect. The professional program in

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pharmacy encourages applications from students who have attained a minimum GPA of 3.0 in their pre-pharmacy science and math courses to apply for admission. Note, however, that in recent years, admitted students have performed at a higher level.

Selection is based on scholastic achievement, aptitude, personal qualifications, and evidence of motivation toward pharmacy. These criteria are judged from the college record, grade point average, the PCAT, letters of reference and evaluation, a supplemental application, and a personal interview. In addition to intellectual and academic competence, the School's Admissions Committee considers communication skills, leadership ability, community service, health care-related or research experience, and motivation for pursuing a career in pharmacy. It is critical that all students possess the ability to communicate effectively using both the oral and written English language. These competencies will be assessed of qualified applicants through an in-person interview and a written essay.

### Deadlines:

February 1 for PharmCAS applications for fall entrance into the professional program. Applicants are advised to apply well in advance of this deadline.

March 1 for PharmCAS supplemental materials (Supplemental Admission Application, Supplemental Admission Application Fee, and a minimum of three completed letters of reference)

November 1 for Supplemental Admission Applications for sophomore Early Assurance program candidates

Number of applicants (2011): over 700

Number of accepted majors (2011): 125

Total number of majors currently enrolled: approximately 500

## About our Courses

Throughout the PharmD curriculum, a student's education consists of both lecture and seminar-type classes, as well as "professional practice" laboratories and experiential activities involving patients and other health care professionals.

In addition to lecture halls and seminar rooms, which are associated with introductory pharmacy practice experiences, the program provides instructional activities in our Pharmaceutical Care Learning Center (PCLC). This center includes a simulated hospital pharmacy, a community pharmacy, a professional practice (compounding) laboratory, a sterile preparation laboratory, a professional practice conference room and lecture room, and an inpatient hospital room containing a "practice patient."

Typical class size:

Upper level/advanced courses - approximately 125

In the Department of Pharmacy Practice, what do student teaching assistants (TAs) do?

They assist in laboratories and in recitations.

### Suggested Introductory Courses

[BIO 200](#) Evolutionary Biology

[BIO 201](#) Cell Biology

[CHE 101-CHE 102](#) General Chemistry I-II or [CHE 105-CHE 106](#) Chemistry: Principles and Applications I-II (and [CHE 100](#) Introduction to Chemistry, if required)

[MTH 121](#) Survey of Calculus and Its Applications I or [MTH 141](#) College Calculus I (based on placement)

[ENG 101](#) and [ENG 201](#) or [ENG 102](#) English Composition and a humanities course (based on placement)

Any Social Behavioral Science (see the Undergraduate Catalog)

[PHM 201](#) Orientation to Pharmaceutical Fields

## About our Faculty

The School of Pharmacy and Pharmaceutical Sciences has two Distinguished Teaching Professors and five recipients of the Chancellor's Awards for Excellence. Four of these faculty members were honored for excellence in teaching. Many faculty members have also received recognition in their areas of specialization, including patents, grants, and national awards.

Faculty in the Department of Pharmacy Practice conduct research as part of the school's Pharmacotherapy Research Center. Some of the areas of study include patient care environments in adult medicine, pediatrics, geriatrics, nephrology, transplantation, infectious diseases, HIV, oncology, neurology, and psychiatry with many funded through federal grants and contracts. Clinical trials are performed, incorporating pharmacokinetics and pharmacodynamics, employing the services of the department's Pharmacometrics Study Unit.

## About our Facilities

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Students enjoy state-of-the-art facilities, laboratories, "smart" classrooms, and centers for research that are among the finest in the world, all in a safe, close-knit setting. Thanks to a 10-to-1 student-to-faculty ratio, School of Pharmacy and Pharmaceutical Sciences students work side-by-side with faculty who have established a reputation for excellence in scholarship, teaching, clinical activities, and research. It's all part of an educational environment based on community and teamwork, with students, alumni, and faculty working together to create an atmosphere of active collaboration, professional development, and mentorship.

In 2012, the School of Pharmacy and Pharmaceutical Sciences will be moving to John and Editha Kapoor Hall on the University at Buffalo's South Campus. The new building will provide high-level teaching and research facilities for pharmacy practice and the pharmaceutical sciences, including patient assessment rooms for clinical counseling and assessment; video monitoring facility for immediate feedback and review; interactive community and hospital care suites enhancing patient-centered pharmaceutical care; a 75 seat Pharmaceutical Care Learning Center with a compounding facility; sterile preparation and intravenous preparation areas and instrumentation area; and pharmacogenetics, nuclear pharmacy and general research laboratories.

The South Campus is home to the University at Buffalo's School of Medicine and Biomedical Sciences, School of Dental Medicine, School of Nursing, and School of Public Health and Health Professions. PharmD students will work in collaboration with their fellow students from these health science schools.

The School of Pharmacy and Pharmaceutical Sciences is also home to the Pharmacy Museum and Turn-of-the-Century Apothecary; these sites provide education to the public regarding the history of the school and the profession of pharmacy. Tours of the facilities are available.

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For further information regarding admission requirements and career information, students are strongly advised to contact the School of Pharmacy and Pharmaceutical Sciences, Office of Admissions and Advisement, 112 Cooke Hall, Buffalo, NY 14260-1200, (716) 645-2825 or [pharm-admin@buffalo.edu](mailto:pharm-admin@buffalo.edu).

### Transfer Policy

The School of Pharmacy and Pharmaceutical Sciences does not have a limit or quota for the number of transfer students who may be admitted. Transfer students are expected to meet the same criteria for admission as non-transfer students. The School does not have a requirement for quarter or semester credit hour completion since credit hours vary among institutions. The School of Pharmacy and Pharmaceutical Sciences does not articulate courses or evaluate transcripts. To find equivalent courses, please refer to UB's online articulation system [TAURUS](#) or refer to the course descriptions on UB's undergraduate catalog.

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### Extracurricular Activities

Students are involved with a number of different professional organizations, such as the National Community Pharmacists Association (NCPA) Student Chapter, the Academy of Student Pharmacists (ASP), the Student National Pharmaceutical Association (SNPhA), Phi Lambda Sigma [Leadership organization], Rho Chi [national pharmacy honor society], Phi Delta Chi, Lambda Kappa Sigma, Western New York Health Systems Pharmacists (WNYSHP), and the Student Pharmacists Association of Western New York (SPAWNY). If you would like to get involved, please research the professional [PharmD Organizations](#) or [Pharmaceutical Sciences Organizations](#) and contact the organization's officers.

### Practical Experience and Special Academic Opportunities

School of Pharmacy and Pharmaceutical Sciences students are encouraged to give back to the community through our comprehensive outreach programs. Our students are involved in many opportunities for professional and personal growth such as the HIV ePharmacotherapy Network and Poison Prevention Education Program, where students participate in community clinics answering questions and educating the public about the proper use of medications. They also visit elementary schools to teach children how to prevent accidental poisonings in their homes. Students attend professional meetings, both locally and nationally, to learn about the latest advances in medication and treatment for various disease states.

Students are required to participate in Introductory Pharmacy Practice Experiences (IPPE) during the first three years of the professional curriculum. These "rotations" provide students an opportunity to put into practice what they are learning in the classroom. PharmD students complete 10 months (40 weeks) of Advanced Pharmacy Practice Experience (APPE) during their fourth professional (P4) year.

The Pharmaceutical Care Learning Center (PCLC) provides students with hospital and community pharmacy training through a simulated hospital pharmacy complete with a drug information center, an IV preparation area, and an inpatient hospital room. There is also a professional practice lab for extemporaneous compounding and a sterile preparation laboratory. The community pharmacy area contains patient counseling rooms with videotaping equipment, computers, telephones, fax machines, and robotics. The PCLC houses a professional practice conference room and a lecture room for small-group lectures and meetings.

#### **Internships**

Pharmacy practice experience is required of all PharmD graduates in order to take the Pharmacist Licensing Examination. The School of Pharmacy and Pharmaceutical Sciences maintains both academic and research affiliations with a variety of local, regional, national and international sites where students may obtain internships and related experience. These sites include the U.S. Food and Drug Administration (FDA), Kaleida Health, National Community Pharmacists Association (NCPA), Buffalo Medical Group, the New York State Center of Excellence in Bioinformatics and Life Sciences, the National Institutes of Health, the ACTG (AIDS Clinical Trial Group), and the University of Zimbabwe, Harare, Zimbabwe.

#### **Clinical Rotations and Post Graduate Opportunities**

Post-graduate residencies and fellowships are available through formalized partnerships with pharmacy practice and research training programs throughout the nation. Some of these programs include alcoholism, anticoagulation, antimicrobial studies, antiviral research, asthma, attention deficit hypersensitivity disorder, cardiovascular pharmacotherapy, clinical pharmacokinetics, critical care pharmacotherapy, diabetes, geriatrics, headache, immunodeficiency services, infectious disease pharmacotherapy, lipids, managed care, medication adherence, neuropharmacology, nicotine addiction/smoking cessation, oncology, pain management, patient education, pediatrics, pharmacology, pharmacoeconomics, pharmacometrics, thyroid disease, and transplant immunosuppression.

#### **Honors, Awards, and Scholarships**

The School of Pharmacy and Pharmaceutical Sciences awards competitive scholarships each year. In addition, students are eligible for funding from many private and public sources including Health Professions Loans, Alumni Association Scholarships, the CVS Scholarship, the Cecil & Violet Newton Scholarship, the Henry A. Panasci, Jr. Pharmacy School Fund, and a Pharmacy short-term loan fund.

Over thirty awards and prizes are presented to graduating PharmD students. These include the Samuel J. Bauda Award for leadership and dedication to community health care, the Lilly Achievement Award for superior scholastic achievement and professional attitude, and the SmithKline Beecham Award for an outstanding student in Clinical Practice.

### Career Information and Further Study

Pharmacists are the "drug experts" among health professionals. They understand how a drug heals and how it can hurt, how it reacts with foods and other drugs. They know its desired effects and its side effects. More than 14,000 prescription drugs are available in the United States, and particularly because of the newer more potent drugs that have highly specific cellular "targets," the management of drug therapy is one of the most important challenges in health care.

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Pharmacy is a well-respected profession for individuals with an aptitude in science and a desire to apply their knowledge of drug therapies to patient care in a variety of settings.

Career Opportunities:

- Biometrics
- Community (ambulatory care)
- Hospitals
- Specialty Compounding
- Veterinary care
- Home care/Infusion therapy
- Industrial/Pharmaceutical Companies
- Legal research
- Hospice/Palliative Care/Pain Management
- Health Maintenance Organization/Managed care
- Neuropharmacology
- Nuclear Oncology
- Primary Care/Pediatrics/Geriatrics
- Pharmacoeconomics
- Academics
- Government/Food and Drug Administration
- Administration
- Public Health/Health Policy
- Research

PharmD graduates find a very favorable job market and easily locate positions in a variety of professional practice sites including community pharmacy, institutional pharmacy, long-term pharmacy, consultant pharmacy, the government and academia across the country. Our graduates practice in the community/ambulatory care settings in professional pharmaceutical centers, neighborhood pharmacies, and stores in ultra-large shopping centers and malls. Other graduates pursue careers in pharmaceutical manufacturing, or the chemical or cosmetic industries. Pharmacists are also employed in pharmaceutical journalism and as drug information specialists or drug therapy consultants. There are also job opportunities in law, research and new product development, management, marketing, quality control and sales. Some seek government employment with the Food and Drug Administration, Public Health Service, the military, or the Veteran's Administration.

What percentage of graduates goes on to find related employment?

Typically, all students are offered pharmacy positions prior to graduation. Many receive multiple employment offers.

Every fall, the school hosts a "Pharmacy Career Day," which attracts employers from organizations throughout the United States and Canada.

Salary Information

PharmD graduates are paid a very attractive salary. Salaries range greatly based upon positions, and work settings and areas of the country.

What percentage of graduates goes on to graduate school?

This is a graduate/professional program. An increasing number of graduates, however, are completing post-graduate residency and fellowship programs.

In addition to the PharmD degree, students may enroll in combined degree programs including PharmD/MBA, PharmD/JD, PharmD/MPH, PharmD/MS, and PharmD/PhD.

Advanced degree holders pursue research or teaching appointments in universities, hospitals, or research foundations.

### Degree Options

The Department of Pharmacy Practice does not offer a program leading to an undergraduate degree. The doctor of pharmacy (PharmD) entails a minimum of two years of pre-pharmacy coursework (prerequisites) followed by four years of the professional pharmacy curriculum. This professional degree is required for licensure as a pharmacist.

A doctor of pharmacy/master of business administration program (PharmD/MBA), doctor of pharmacy/juris doctor (PharmD/JD) degree, doctor of pharmacy/master of public health (PharmD/MPH), doctor of pharmacy/doctor of philosophy in pharmaceutical sciences (PharmD/PhD), and doctor of pharmacy/master's of science in pharmaceutical sciences (MS) programs are available.

### Degrees Offered

**Graduate:** PharmD (Pharmacy)

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Combined: PharmD/MBA; PharmD/JD, PharmD/MPH; PharmD/PhD; PharmD/MS

### Links to Further Information About this Program

- [Undergraduate Catalog](#)
- [Graduate Admissions](#)
- [Department of Pharmacy Practice](#)
- [School of Pharmacy and Pharmaceutical Sciences](#)

### Pharmacy - PHARM.D.

#### Acceptance Criteria

Please contact the School of Pharmacy and Pharmaceutical Sciences Office of Admissions and Advisement for information (112 Cooke Hall, 716-645-2825, pharm-admin@buffalo.edu) or visit [www.pharmacy.buffalo.edu/admissions.shtml](http://www.pharmacy.buffalo.edu/admissions.shtml).

#### Advising Notes

\*This is not a baccalaureate degree program; instead, it is a four-year graduate level doctor of pharmacy (PharmD) followed by a minimum of two years of undergraduate coursework. An undergraduate degree is not required prior to admission into this graduate/professional program, but is strongly encouraged.

#### Prerequisite Courses

General or Inorganic Chemistry I with Laboratory ([CHE 101](#) or [CHE 105](#))  
General or Inorganic Chemistry II with Laboratory ([CHE 102](#) or [CHE 106](#))  
Organic Chemistry I with Laboratory ([CHE 201](#) or [CHE 251](#))  
Organic Chemistry II with Laboratory ([CHE 202](#) or [CHE 252](#))  
Introductory Biology I with Laboratory ([BIO 200](#))  
Introductory Biology II with Laboratory ([BIO 201](#))  
Physics I ([PHY 101](#) or [PHY 107](#) - lab optional)  
Calculus I ([MTH 121](#) or [PHY 141](#))  
Calculus II ([MTH 122](#) or [MTH 142](#))  
Statistics ([STA 119](#) or [PSY 207](#))  
Anatomy and Physiology ([ANA 113](#); [PGY 451](#) and [PGY 452](#) ([PGY 300](#) by permission only))  
Microbiology ([MIC 301](#))  
Biochemistry ([BCH 403](#))  
A Social and Behavioral Science course  
English Composition I ([ENG 101](#) or [ENG 102](#) - based on placement)  
English Composition II ([ENG 201](#) or humanities - based on placement)

NOTE: English Composition must be completed in the US, Canada, UK, Australia, or New Zealand and approved by the University at Buffalo.

[General Education](#) requirements also must be completed by the end of the spring semester prior to starting the doctor of pharmacy (PharmD) program advanced pharmacy experience program (P4) year. Early Assurance students must complete the required science and math prerequisites as well as the University at Buffalo's [General Education](#) requirements by the end of the spring semester prior to the fall entry of the first progression year of the PharmD program. See the following website for additional information: [Early Assurance](#).

#### Required Courses

##### PROFESSIONAL PROGRAM

The professional curriculum involves graduate/professional-level courses. Information regarding these courses may be obtained in the School of Pharmacy and Pharmaceutical Sciences Office of Admissions and Advisement, 112 Cooke Hall, North Campus, Buffalo, NY 14260-1200, (716) 645-2825, [pharm-admin@buffalo.edu](mailto:pharm-admin@buffalo.edu) or online at [www.pharmacy.buffalo.edu](http://www.pharmacy.buffalo.edu).

#### Recommended Sequence of Program Requirements

##### FIRST YEAR

[BIO 200](#); [CHE 101](#) or [CHE 105](#)

English composition ([ENG 101](#) or 102)

Social/Behavioral Science course or pre-calculus (if necessary)

##### Remaining semesters:

[BIO 201](#)

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[CHE 102](#) or 106  
[CHE 201](#) or 251  
[CHE 202](#) or 252  
[MTH 121](#) or 141  
[MTH 122](#) or 142  
[PHY 101](#) or 107  
[STA 119](#) or [PSY 207](#)  
[ANA 113](#)  
[MIC 301](#)  
[PGY 451](#) and 452  
[BCH 403](#)  
[ENG 201](#) or humanities course  
[UGC 111](#)  
[UGC 112](#)  
[UGC 211](#) (or cognate)  
Arts Elective  
[PHM 201](#) is optional (offered each spring semester)  
Summer Enrollment may be required if completion of prerequisites within two years is desired

### **PHC 409: Pharmacy Calculations**

**Credits:** 3  
**Type:** LEC/REC

Applies pharmaceutical mathematical concepts and techniques to contemporary pharmacy practice. Explores problem solving and covers descriptive and inferential statistical techniques, applying them to pharmaceutical study and practice.

### **PHC 410: Physical Pharmacy**

**Credits:** 3  
**Pre-requisites:** [PHC 311](#) Or [PHM 311](#)  
**Type:** LEC

Covers physical chemical properties of drugs, theory and practice applicable to design and evaluation of drug dosage forms, principles of solubility, solution equilibria, chemical kinetics, heterogenous systems, and solids.

### **PHM 201: Orientation to Pharmaceutical Fields**

**Credits:** 1  
**Semester(s):** Spring  
**Type:** LEC

*For pre-pharmacy students.*

Presents an overview of career opportunities in various pharmacy fields as well as in the pharmaceutical sciences. Also discusses requirements for admission into the professional program in pharmacy.