

pharmacology, developing an understanding of pharmacology from molecular processes through drug effects in whole, living organisms to clinical drug development. The sections for the course have been modeled on the divisions of the American Society for Pharmacology and Experimental Therapeutics, a 4800-member scientific society whose members conduct basic and clinical pharmacological research for academia, government, large pharmaceutical companies, small biotech companies, and non-profit organizations. The course sections include Neuropharmacology, Molecular Pharmacology, Behavioral Pharmacology, Cardiovascular Pharmacology, Toxicology, Drug Discovery and Development, and Integrative Systems, Translational, and Clinical Pharmacology.

PHA 846. Current Topics in Pharmaceutical Sciences (3 hours)

This course explores recent advances in the pharmaceutical sciences that are published as primary research reports in first-tier scientific journals.

PHA 847. Molecular and Behavioral Neuropharmacology (3 hours)

This course provides students with foundational knowledge in the fields of molecular neuropharmacology and behavioral neuropharmacology in the context of basic and applied science research.

PHA 849. Special Topics in Pharmaceutical Sciences (3 hours)

A course to provide an in-depth coverage of a variety of current topics in the pharmaceutical sciences.

PHA 850. Immunology (3 hours)

This course provides a comprehensive foundation on the structure and function of the human immune system. Topics include innate immunity, adaptive immunity, functions of B and T lymphocytes, immunodeficiency, hypersensitivity, autoimmune disease, transplantation immunity, cancer immunity, vaccination and immunological methods. Proficiency in teaching and oral presentation is developed through student led tutorials on immunological methods.

PHA 899. Doctoral Research (1 - 9 Hours)

Research for doctoral students. This course is taught on a satisfactory/unsatisfactory grade basis.

Doctor of Pharmacy/Doctor of Philosophy Program

Program Description

The Doctor of Pharmacy (Pharm.D.)/Doctor of Philosophy (Ph.D.) Degree Program enables highly qualified students to obtain both degrees in a shortened period. This Pharm.D./Ph.D. Degree program is designed primarily for students who are strongly motivated toward an academic/research career in the pharmaceutical sciences. Students may pursue a clinical specialization in experimental pharmacotherapeutics or medicinal chemistry, pharmaceuticals, pharmacology, or toxicology. The program is flexible enough to accommodate individuals of varied educational backgrounds. The actual time required for completion of the program is variable and depends primarily on the individual's progress in their dissertation research.

Admissions Process and Requirements

In order to enroll in the Pharm.D./Ph.D. program, a student must separately apply for and gain admission to both the Pharm.D. and the Ph.D. programs. It is recommended that application to the Ph.D. program be made at the same time of application to the Pharm.D. program. A Pharm.D. student may join the Pharm.D./Ph.D. program by gaining admission to the Ph.D. program. However, this should be done by spring semester of the first year to gain full potential benefits of the program. Application forms for admission to the Ph.D.

degree program may be obtained from the Department of Pharmaceutical Sciences website.

All applicants to the Pharm.D./Ph.D. program must have an earned Bachelor of Arts or Bachelor of Science degree. In addition, applicants are expected to satisfy the requirements for admission to both Pharm.D. and Ph.D. programs.

Program Requirements

Upon acceptance into the Pharm.D./Ph.D. Degree Program, an advisor from the faculty of the Department of Pharmaceutical Sciences will be assigned to the student. The advisor will schedule the program of study until the student selects a major professor. The specific program selected will be determined by the student's previous academic history as well as by the departmental requirements of the Ph.D. program. The structure of the Pharm.D./Ph.D. Degree Program differs from that of the Pharm.D. program in several respects.

1. During the first year, the student's research capability and commitment will be assessed through documented evaluation by the research advisor after the end of the 1st semester, 2nd semester, and again at the end of the 1st summer, with oversight of the Dissertation Committee as well as the Director of Graduate Studies and Department Chair. Additionally, Pharm.D./Ph.D. students will complete a self-assessment of their first year and present their first year research results at the end of the first summer as a requirement for progression. At the end of the first year, if progress is determined to be unsatisfactory, the student has the option of changing dissertation advisors, if one is willing to take them.
2. Pharm.D./Ph.D. students will take Ph.D. core courses in place of professional electives that simultaneously satisfy the requirements of both the Pharm.D. electives and the Ph.D. program.
3. Pharm.D./Ph.D. students are exempt from the following Ph.D. core courses: PHA 715, Pharmacokinetics (3 hours); PHA 742, Foundations in Pharmaceutical Sciences (5 hours).
4. Pharm.D./Ph.D. students are required to complete four (4) Advanced Pharmacy Practice Experiences (APPEs) in the areas of Community Pharmacy, Institutional Pharmacy, Adult Medicine, and Ambulatory Care. In addition, students complete four (4) elective experiences, of which two (2) must have a patient-care component, and can register for PHA 696 (Research) over two (2) APPE blocks. A third elective research block may be taken as a ninth APPE. PHA 620 (Pharmacy Review I), PHA 621 (Pharmacy Review II), and PHA 622 (Pharmacy Review III) are also required.
5. The student is expected to participate in Graduate Seminar throughout their matriculation and to enroll for credit in the summer semester beginning with the third year.
 - a. Following completion of the third year, the student focuses on the research component of the curriculum. With the exception of the Advanced Pharmacy Practice Experiences, the student should have completed all prerequisite and core courses by this time.

Continuation in the Pharm.D./Ph.D. Degree Program is contingent upon satisfactory performance and progress toward fulfillment of the requirements of the Doctor of Pharmacy Degree Program and the Doctor of Philosophy Degree Program. Students admitted to the Pharm.D./Ph.D. degree program are expected to complete all program requirements. Should a student decide to withdraw from the combined degree program at

any point, they must reapply for admission to either program separately, and if accepted, they must fulfill all requirements of either program individually.

Financial Arrangements

Students who are enrolled in the combined Pharm.D./Ph.D. Degree Program will pay full tuition for the first three years. Tuition waiver will be granted for the remainder of the program, normally the fourth through seventh years. Students will be encouraged to apply for extramural funding of their educational program. Departmental stipends will be awarded on a competitive basis for years 4-7, subject to availability. Stipend support beyond this time will be based on extramural funding. Financial support through tuition waiver or stipends is provided based on contribution to the teaching program as described in departmental policies.

Masters of Science (M.S.) in Pharmaceutical Sciences Program

Program Description

The Masters of Science (M.S.) in Pharmaceutical Sciences Degree Program is offered to students who demonstrate exceptional scholarly activity through achievement in academics and original thesis research or non-thesis project in an area of the pharmaceutical sciences. The program is flexible enough to accommodate individuals of varied educational backgrounds. The time required for completion of the program is two years. The program is offered with two options, a) a thesis option b) a non-thesis project Option. A student who opts for Thesis Research must be in residence at all times including at the time of completion of the Thesis. Students who opt for the Non-Thesis Project option may choose to take listed courses online but it must be synchronous. Students who opt for the Thesis Research option, must take courses in-person only.

Purpose Outcomes/Objectives

The Masters in Pharmaceutical Sciences (M.S.) degree is granted to students who demonstrate exceptional scholarly activity through achievement in academics and original research in an area of the pharmaceutical sciences. The specific goals of this graduate program include:

1. Equipping the graduates with the skills necessary to perform in academia, in the pharmaceutical industry or in government;
2. Fostering the development of oral and written communication skills to be used in classroom instruction, in the presentation of research findings to the scientific community and in interdisciplinary collaborative research efforts.

Admission policy

Application for admission must be made on forms that may be obtained from the Department of Pharmaceutical Sciences or the department web page. An application cannot be given final consideration until all required components have been received. A complete application consists of the following:

1. Applicants must apply online into the PharmGrad application system and all material as required must be uploaded into the on-line system.
2. Official transcripts. An official transcript is one that has been issued by an institution and received by the Department in an envelope sealed by the issuing institution. The transcript will contain the official college seal or stamp and the signature of the Registrar. You are required to submit one separate official