

# PHARMACEUTICAL SCIENCES, DOCTOR OF PHILOSOPHY

## Graduate Program in Pharmaceutical Sciences

The **Pharmaceutical Sciences Graduate Program** is housed in the Department of Pharmaceutical Sciences in the College of Pharmacy and Health Sciences (COPHS) and is led by a group of active, productive faculty. Over the last several years, COPHS faculty have been successfully developing its research infrastructure and capabilities.. Collectively, the Center for Biomedical and Minority Health Research supported by NIMHD, the Center for Comprehensive PK/PD & Formulation supported by CPIRT, and Institute of Drug Discovery and Development supported by NCI, have contributed significantly to the development of research infrastructure in COPHS.

The Doctor of Philosophy in Pharmaceutical Sciences with specialization in pharmacology and pharmaceuticals is offered through the program. The Ph.D. degree curricula are designed to provide a scientifically integrated training that permits students to:

1. Acquire knowledge and skills that facilitate a comprehensive understanding of the genesis and progression of pathological conditions;
2. Apply knowledge and skills to the discovery, design, development, and delivery of drugs and dosage forms and conduct pharmacokinetics and pharmacodynamics studies;
3. Be prepared to pursue professional careers in academic, pharmaceutical industry, and governmental settings.

## Admission Requirements

In addition to meeting the requirements and following the procedures for admission to the Graduate School, applicants to the Doctor of Philosophy in Pharmaceutical Sciences must have earned a bachelor's degree in

the natural or health sciences. Admission to the Ph.D. in Pharmaceutical Sciences program will be granted to students who are judged most likely to achieve eminence in the field. It is anticipated that a small number of students will be granted admission each year. Other specific requirements for admission to the program include:

1. An acceptable combined score on the Graduate Record Examination.
2. A minimum cumulative undergraduate GPA of 2.75.
3. Three letters of recommendation from individuals who are familiar with the applicant's previous academic performance and potential for success in graduate school.
4. Equivalent quantitative and qualitative measures indicating academic performance acceptable to the graduate admissions committee.

Socioeconomic factors will also be used to determine an applicant's admission status. International students, in addition to the above requirements, must meet the English Proficiency requirements of the Graduate School.

The primary objective of the Ph.D. degree program is to train students for advanced careers in pharmaceutical sciences. Specialization with two specific tracks, 1) pharmacology and 2) pharmaceuticals, will be offered for the Ph.D. degree. Course requirements for a Ph.D. in Pharmacology and

Ph.D. in Pharmaceuticals are tabulated below; the course descriptions are listed in item D.

The primary objective of the Ph.D. degree program is to train students for advanced careers in pharmaceutical sciences. Specialization with two specific tracks, 1) pharmacology and 2) pharmaceuticals, will be offered for the Ph.D. degree. Course requirements for a Ph.D. in Pharmacology and Ph.D. in Pharmaceuticals are tabulated below; the course descriptions are listed in item D.

## Pharmacology Track

Code	Title	Hours
Core Courses (p. 1)		21
Electives (p. 1)		6
Seminars (p. 1)		4
Research and Dissertation (p. 2)		43
<b>Total Hours</b>		<b>74</b>

## Core Courses

Code	Title	Hours
PHS 800	Bioethics	3
PHS 801	Biostatistics	3
PHS 808	Advanced Pathophysiology	3
PHS 809	Receptor Pharmacology	3
PHS 811	Biopharmaceutics	3
PHS 812	Advanced Biochem	3
PHS 913	Molecular Pharmacology	3
<b>Total Hours</b>		<b>21</b>

## Electives

Code	Title	Hours
Select two courses from the following:		6
PHS 806	Drug Dev. and Reg. Affairs	
PHS 807	Exp Design/Instr/Clin Measurmt	
PHS 813	Advanced Organic Chem	
PHS 900	Biosyn and Drug Metabolism	
PHS 901	Cell Biology	
PHS 904	Genetics and Pharmacogenomics	
PHS 905	Advanced Medicinal Chem	
PHS 910	Endocrine Pharmacology	
PHS 912	Neurpharmacology	

## Seminars

Code	Title	Hours
PHS 802	Sem/Special Topics	1
PHS 803	Seminar/Special Topics	1
PHS 804	Seminar/Grantsmanship	1
PHS 805	Seminar/Grantsmanship	1
<b>Total Hours</b>		<b>4</b>

## Research and dissertation

Code	Title	Hours
PHS 814	Lab Rotation	3
PHS 916	PhD Research I	1-3
PHS 917	PhD Research II	1-3
PHS 918	PhD Dissertation I	1-9
PHS 919	PhD Dissertation II	1-9
<b>Total Hours</b>		<b>7-27</b>

## PHARMaceutics TRACK

Code	Title	Hours
Core Courses (p. 1)		21
Electives (p. 1)		6
Seminars (p. 1)		4
Research and Dissertation (p. 2)		43
<b>Total Hours</b>		<b>74</b>

## CORE Courses

Code	Title	Hours
PHS 800	Bioethics	3
PHS 801	Biostatistics	3
PHS 809	Receptor Pharmacology	3
PHS 810	Physical Pharmacy	3
PHS 811	Biopharmaceutics	3
PHS 812	Advanced Biochem	3
PHS 908	Advanced Drug Delivery Sys	3
<b>Total Hours</b>		<b>21</b>

## ELECTIVES

Code	Title	Hours
Select 2 courses from the following:		6
PHS 806	Drug Dev. and Reg. Affairs	
PHS 807	Exp Design/Instr/Clin Measurmt	
PHS 900	Biosyn and Drug Metabolism	
PHS 901	Cell Biology	
PHS 906	Advanced Pharmacokinetics	
PHS 907	Advanced Pharmaceutics	
<b>Total Hours</b>		<b>6</b>

## Seminars

Code	Title	Hours
PHS 802	Sem/Special Topics	1
PHS 803	Seminar/Special Topics	1
PHS 804	Seminar/Grantsmanship	1
PHS 805	Seminar/Grantsmanship	1
<b>Total Hours</b>		<b>4</b>

## research and dissrtation

Code	Title	Hours
PHS 814	Lab Rotation	3
PHS 916	PhD Research I	1-3

PHS 917	PhD Research II	1-3
PHS 918	PhD Dissertation I	1-9
PHS 919	PhD Dissertation II	1-9
<b>Total Hours</b>		<b>7-27</b>

## Philosophy, PhD Program Requirements

Completion of 74 credit hours of course work.

### Qualifying Examination

The exam should be taken as soon as a student completes the Foundation/Leveling Courses, usually within the 1st year of the graduate program. The purpose of the qualifying examination will be to test the student's level of understanding of basic concepts in the pharmaceutical sciences. This examination not only will be a test of a student's preparation to undertake doctoral work, but also will be used as a diagnostic tool to indicate whether or not further work in any of the these areas will be needed. Until the student passes the qualifying examination (minimum 75%), he/she will be limited in the advanced doctoral coursework that he/she can take.

### Comprehensive Examination

The examination is intended to test a student's mastery of the skills and knowledge that should have been acquired in the program of study. Upon the successful completion of this examination and other graduate school requirements, the student becomes a candidate for the doctoral degree. The examination will be taken at the end of the period of formal course work and study, but prior to the commencement of substantial work on the dissertation. The examination cannot be taken until all credit hour requirements are completed. A candidate will be given two attempts to take and pass the Comprehensive Examination (minimum 75%). Therefore, concerted work on the dissertation will not normally begin until the student has passed the comprehensive examination. A doctoral student who fails the comprehensive examination the second time may petition for a third examination. The petition must show a plan of action in which the petitioner will engage to enhance his/her chances for satisfactorily completing the examination that was failed. The chairperson of the student's doctoral committee, the department head, the dean of the college and the dean of the graduate school must approve the petition. A student who fails to pass the doctoral comprehensive exam or any part of it after the third attempt will be automatically discontinued as a student in the doctoral degree program.

### Doctoral Candidacy

The doctoral student must satisfy the following requirements before he/she can be admitted to candidacy for the degree:

1. Be admitted unconditionally to the Doctor of Philosophy in pharmaceutical sciences degree program.
2. Satisfy the residency requirement of two consecutive semesters of full-time residence or an approved equivalence.
3. Pass the doctoral comprehensive examination.

### Dissertation Work and Oral Public Defense of the Dissertation

After achieving candidacy, the advisor in consultation with the candidate will recommend a dissertation committee to the Dean of the Graduate School. The dissertation committee will consist of a minimum of three graduate faculty members with demonstrated expertise in the focus of the dissertation. These three members include the dissertation advisor, one member from a faculty of the College of Pharmacy and Health

Sciences, a third member who will be a graduate school representative appointed by the Dean of the Graduate School, and potentially an additional member from an outside institution. The dissertation advisor will serve as chairman of the dissertation committee. When the dissertation proposal has been approved the candidate will:

- complete the required research,
- prepare a dissertation, and
- make an oral defense to the committee.

If failed, the candidate must petition the Dean of the Graduate School, through his department, for permission to take the examination a second time. A second examination will not be permitted within a period of one semester after a failure is recorded on the first attempt. The dissertation serves a number of purposes and involves the following:

1. satisfying the academic community.
2. Meeting the university standards.
3. Demonstrating to the supervisory committee that the student is capable of undertaking and successfully completing

Dissertation or thesis research courses receive grades of satisfactory or unsatisfactory only. Grades are assigned only after the defense of the dissertation or thesis. A successful defense and submission of the dissertation or thesis requires the supervising member of faculty to assign a satisfactory grade for the appropriate research courses.

## Publications

The ability to develop and test scientifically meritorious hypotheses and publish the findings in peer-reviewed, indexed scientific journals is a critical skill for advanced careers in pharmaceutical sciences. The Ph.D. candidate must demonstrate ability in this area by:

- a. Making a minimum of two presentations at national research meetings.
- b. Publishing a minimum of one paper in a peer-reviewed indexed scientific journal.
- c. Submitting a minimum of one research paper for publication in an indexed-refereed journal.

## Time Limit for the Completing of the Doctor of Philosophy Degree

After being admitted to a program leading to the Doctor of Philosophy degree, a student will be allowed seven calendar years in which to complete all the program requirements. Continuation in the doctoral degree program beyond the seven-year limit must be approved by the student's Doctoral Degree Advisory Committee and the Dean of the Graduate School. The maximum time allowed to complete the doctoral program, including an approved extension, is nine calendar years. This time limit does not include work done as part of the requirements for the master's degree. Credits earned more than seven years prior to the date of completion of doctoral degree requirements at Texas Southern University cannot be accepted toward satisfying the doctoral degree requirements.

## Readmission

A student who discontinues matriculation in the Graduate School for one or more semesters must apply for readmission. The evaluation of applications for readmission will be based on University and specific

program admission requirements in existence at the time of the re-admission application.