

PHARMACOLOGY, MS

Degree: Master of Science (MS)

Field of Study: Pharmacology

Program Overview

Although training efforts by the Department of Pharmacology are primarily directed toward the award of the PhD degree, training for the MS degree is also offered in a variety of contexts. For example, research assistants in the Department who seek educational advancement may pursue the MS degree via Plan A (thesis) or Plan B (coursework only). Medical students who seek to specialize in Pharmacology during the scholarly research component of their preclinical program may pursue the MS degree. Employees in the Biotechnology Industry may seek advanced training in Pharmacology by pursuing the MS degree at Case. Finally, a PhD candidate who is unable to complete the PhD requirements for extraordinary reasons may petition to have earned credits transferred to fulfill MS degree requirements.

Graduate Policies

For graduate policies and procedures, please review the School of Graduate Studies section of the General Bulletin.

Program Requirements

Plan A: Thesis (Research)

In addition to the course requirements below, candidates for this degree are required to submit an acceptable written thesis based on their original research and register for at least 9 credit hours of PHRM 651 (master's dissertation research). The acceptability of the thesis will be determined by an oral examination administered by the student's Thesis Advisory Committee. This committee must be chaired by a member of the primary Faculty of Pharmacology, and it should include the research mentor and two other faculty members (total of four faculty members, two from the Department of Pharmacology). A minimum of 30 credit hours is required. For these students, passing the final exams in PHRM 401 and PHRM 402 satisfies the requirement for a Comprehensive Exam for the MS Degree.

Code	Title	Credit Hours
Required Courses:		
IBMS 450	Fundamental Biostatistics to Enhance Research Rigor & Reproducibility	1
IBMS 453	Cell Biology I	3
IBMS 455	Molecular Biology I	3
IBMS 456A	Since You Were Born: Nobel Prize Biomedical Research in the Last 21 Years- Section A	1
PHRM 401	Principles of Pharmacology I: The Molecular Basis of Therapeutics	3
PHRM 402	Principles of Pharmacology II: The Physiological Basis of Therapeutics	3
PHRM 511	Frontiers in Pharmacology	0-1

PHRM 651	Thesis M.S.	1-18
Total Credit Hours		30

Plan B: Non-Thesis (Coursework)

This program is aimed at students who seek a Master's Degree but do not intend to specialize in research following their Master's work. To satisfy the requirement for a Comprehensive Exam for the MS Degree, students register for 1 credit of EXAM 600 during their final semester and sit for an integrative essay question-style examination on the content of the required coursework. A total of 30 credit hours are required.

The advancement of understanding and practice of therapeutics is based on research. Therefore all students in degree programs in Pharmacology are expected to become involved in independent research and scholarship. Registration for PHRM 601 requires a pre-arrangement with a faculty mentor who will oversee the combination of study and bench research and proscribe the basis for satisfactory performance, including oral and written reports. With pre-approval of the Departmental Director of Graduate Studies, a student's study plan may substitute additional specific advanced courses to replace PHRM 601 credits.

Code	Title	Credit Hours
Required Courses:		
IBMS 450	Fundamental Biostatistics to Enhance Research Rigor & Reproducibility	1
IBMS 453	Cell Biology I	3
IBMS 455	Molecular Biology I	3
IBMS 456A	Since You Were Born: Nobel Prize Biomedical Research in the Last 21 Years- Section A	1
PHRM 401	Principles of Pharmacology I: The Molecular Basis of Therapeutics	3
PHRM 402	Principles of Pharmacology II: The Physiological Basis of Therapeutics	3
PHRM 511	Frontiers in Pharmacology	0-1
PHRM 601	Independent Study and Research	1-18
EXAM 600	Master's Comprehensive Exam	1
PHRM Electives		6
Total Credit Hours		30

Sample Plan of Study

Plan A: Thesis (Research)

First Year

Fall		Credit Hours
IBMS 453	Cell Biology I	3
IBMS 455	Molecular Biology I	3
PHRM 651	Thesis M.S.	1
IBMS 456A	Since You Were Born: Nobel Prize Biomedical Research in the Last 21 Years- Section A	1

IBMS 450	Fundamental Biostatistics to Enhance Research Rigor & Reproducibility	1
Credit Hours		9
Spring		
PHRM 401	Principles of Pharmacology I: The Molecular Basis of Therapeutics	3
PHRM 402	Principles of Pharmacology II: The Physiological Basis of Therapeutics	3
PHRM 651	Thesis M.S.	3
Credit Hours		9
Second Year		
Fall		
PHRM 511	Frontiers in Pharmacology	1
PHRM Elective		3
PHRM 651	Thesis M.S.	5
Credit Hours		9
Spring		
PHRM 511	Frontiers in Pharmacology	1
PHRM Elective		3
PHRM 651	Thesis M.S.	5
Credit Hours		9
Total Credit Hours		36

Plan B: Non-Thesis (Coursework)

		Credit Hours
First Year		
Fall		
IBMS 453	Cell Biology I	3
IBMS 455	Molecular Biology I	3
IBMS 456A	Since You Were Born: Nobel Prize Biomedical Research in the Last 21 Years- Section A	1
IBMS 450	Fundamental Biostatistics to Enhance Research Rigor & Reproducibility	1
Credit Hours		8
Spring		
PHRM 401	Principles of Pharmacology I: The Molecular Basis of Therapeutics	3
PHRM 402	Principles of Pharmacology II: The Physiological Basis of Therapeutics	3
PHRM 601	Independent Study and Research	2
Credit Hours		8
Second Year		
Fall		
PHRM 511	Frontiers in Pharmacology	1
PHRM Elective		3
PHRM 601	Independent Study and Research	2
Credit Hours		6
Spring		
PHRM 511	Frontiers in Pharmacology	1
PHRM Elective		3
PHRM 601	Independent Study and Research	3

EXAM 600	Master's Comprehensive Exam	1
Credit Hours		8
Total Credit Hours		30

Dual Degree Options

- Pharmacology, MS/Medicine, MD