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 offered also 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 | Hours
--- | --- | ---
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 | Pharmacology Seminar Series | 0 - 1
PHRM 651 | Thesis M.S. | 1 - 18

Total 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 | Hours
--- | --- | ---
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 | Pharmacology Seminar Series | 0 - 1
PHRM 601 | Independent Study and Research | 1 - 18
EXAM 600 | Master’s Comprehensive Exam | 1
PHRM Electives | 6

Total Hours: 30

Sample Plan of Study

Plan A: Thesis (Research)

<table>
<thead>
<tr>
<th>First Year</th>
<th>Hours</th>
</tr>
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<tbody>
<tr>
<td><strong>Fall</strong></td>
<td></td>
</tr>
<tr>
<td>IBMS 453</td>
<td>Cell Biology I</td>
</tr>
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</tr>
<tr>
<td>IBMS 456A</td>
<td>Since You Were Born: Nobel Prize Biomedical Research in the Last 21 Years- Section A</td>
</tr>
</tbody>
</table>

| IBMS 450 | Fundamental Biostatistics to Enhance Research Rigor & Reproducibility | 1 |

| Hours | 9 |
Dual Degree Options

• Medicine, MD/Pharmacology, MS

Plan B: Non-Thesis (Coursework)

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

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

Hours  8

Second Year

Fall

PHRM 511  Pharmacology Seminar Series  1
PHRM Elective  3
PHRM 601  Independent Study and Research  2

Hours  6

Spring

PHRM 511  Pharmacology Seminar Series  1
PHRM Elective  3
PHRM 601  Independent Study and Research  3
EXAM 600  Master's Comprehensive Exam  1

Hours  8

Total Hours  30