Master of Science in Pharmaceutical Sciences

Overview

A 38 credit Master of Science in Pharmaceutical Sciences ("MSPS") degree is being offered by the Department of Pharmaceutical and Administrative Sciences in the College of Pharmacy and Health Sciences. This degree program can be completed in five full-time semesters (fall, spring, summer, fall, spring). Students can customize the focus area of their research degree through available elective courses and by the selection of a thesis advisor in a specific field, such as Medicinal Chemistry, Pharmacology, Pharmaceutics, Pharmacogenomics, Biomedical Sciences, Biopharmaceutical Sciences and Technology, or Pharmacoeconomics and Healthcare Data Analytics.

Program Outcomes

Students will be expected to achieve the following primary outcomes prior to graduation, which will demonstrate competency in core knowledge areas and relevant skill sets:

1. Demonstrate knowledge of core principles that are critical to health care fields.
2. Apply concepts in the medical sciences toward the mechanisms of action of drugs.
3. Apply advanced biostatistical and analytical techniques to experimental design and data interpretation.
4. Gain proficiency in basic pharmaceutical techniques.
5. Demonstrate knowledge of and practice responsible conduct of research.
6. Demonstrate knowledge of the major classes of drug therapy, including their mechanisms and side effects.
7. Demonstrate knowledge of novel areas of drug development and treatment approaches.
8. Critically evaluate current scientific advances in the pharmaceutical sciences.
9. Demonstrate proficiency in executing aims of a research project based on specifically developed hypotheses.
10. Demonstrate proficiency in scientific communication.
11. Demonstrate knowledge of the principles of cGXP and understand the role of the FDA and other agencies in regulating and approving drug products.

Total Credit Hours: 38

Degree Requirements

A total of 38 credits is required for graduation.

Core Course Requirements - 29 credits

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- Seminar and Journal Club 1 (1 credit)
- Seminar and Journal Club 2 (1 credit)

- Analytical Techniques (1 credit)
- Data Analysis and Biostatistics (3 credits)
- Responsible Conduct of Research (3 credits)
- Mechanisms of Drug Action (3 credits)
- Advanced Therapeutic Medicinal Products (3 credits)
- cGXP and Regulatory Affairs (3 credits)
- Scientific Communications (3 credits)
- Thesis Research 1, 2, 3 (3 courses, 8 credits total)

Subtotal: 29

Electives - 9 credits

* Electives selected based on elective sequence and consultation with thesis advisor.

Subtotal: 9 credits

Course Sequence

First Year - Fall Semester

PHRSC 510	Seminar & Journal Club 1	1cr.
PHRSC 526	Analytical Techniques Lab	1cr.
PHRSC 527	Data Analysis & Biostatistics	3cr.
PHRSC 529	Responsible Conduct of Research	3cr.
PHRSC 582	cGXP and Regulatory Affairs	3cr.
XXXX xxx	Elective(s)	2-4 cr.

Subtotal: 13-15

First Year – Spring Semester

PHRSC 520	Seminar & Journal Club 2	1cr.
PHRSC 557	Mechanisms of Drug Action	3cr.
PHRSC 572	Advanced Therapeutic Medicinal Products	3cr.
XXXX xxx	Elective(s)	2-4cr.

Subtotal: 9-11

Second Year - Summer Semester

PHRSC 528	Thesis Research 1	2cr.

Subtotal: 2

Second Year - Fall Semester

PHRSC 618	Thesis Research 2	3cr.
PHRSC 630	Scientific Communication	3cr.
XXXX xxx	Elective(s)	3-4cr.

Subtotal: 9-10

Second Year - Spring Semester

PHRSC 628	Thesis Research 3	3 cr.

Subtotal: 3

Subtotal: 38

Total Credit Hours: 38

Degree completion requirements:
1) All courses passed ("C" or better), with no more than two courses with a grade of "C" or "C+"" and
2) Attain an overall grade point average of 3.0 or higher.

MS in Pharmaceutical Sciences Electives

In both years of the MSPS program, there are elective options designed to allow students to personalize and specialize their course of study based on their research interests and in consultation with their advisor and committee. Focus areas of the sequences are possible in the areas of Pharmacology, Medicinal Chemistry and Drug Development, Pharmaceutics and Drug Delivery, Pharmacogenomics, Biomedical Sciences, Pharmacoeconomics and Healthcare Data Analytics, and Biopharmaceutical Sciences and Technology. Potential elective courses are listed below. Students are free to develop their own plan of elective sequences.

Suggested Courses in Each Area of Pharmaceutical Sciences

Pharmacology

PHRSC 513	Biochemistry	3cr.
PHRSC 522	Pathophysiology	3cr.
PHRSC 515	Principles of Pharmacology	3cr.

Medicinal Chemistry and Drug Development

PHRSC 513	Biochemistry	3cr
PHRSC 612	Principles of Medicinal Chemistry	3cr.
PHRSC 515	Principles of Pharmacology	3 cr.

Pharmaceutics and Drug Delivery

PHRSC 514	Pharmaceutics I	2cr.
PHRSC 518	Pharmaceutical Calculations	2cr.
PHRSC 524	Pharmaceutics II	2cr.

PHRSC 525	Pharmaceutics II Laboratory	1cr.
PHRSC 556	Pharmacokinetic Sciences	2cr.

Pharmacogenomics

PHRSC 523	Medical Genetics and Pharmacogenomics	2cr.
PHRSC 515	Principles of Pharmacology	3cr.
PHRSC 552	Applied Genetics, Pharmacokinetics, and PGx	2cr.
PHRSC 560	Genetic Research & Bioinformatics	3cr.

Biomedical Sciences

PHRSC 512	Immunology	3cr.
PHRSC 522	Pathophysiology	3cr.
PHRSC 515	Principles of Pharmacology	3cr.

Pharmacoeconomics and Healthcare Data Analytics

PHRSC 511	Drug Information and Informatics	2 cr.
PHRSC 517	Health Care Policy & Delivery	2 cr.
PHRSC 530	Pharmacy Outcomes	2 cr.
PHRSC 560	Genetic Research and Bioinformatics	3 cr.

Biopharmaceutical Sciences and Technology

PHRSC 570	Biopharmaceutical Technology I	3 cr.
PHRSC 580	Biopharmaceutical Technology II	3 cr.
PHRSC 581	Biopharmaceutical Technology Lab II	1 cr.
EMGT 643	Design of Experiments	3 cr.