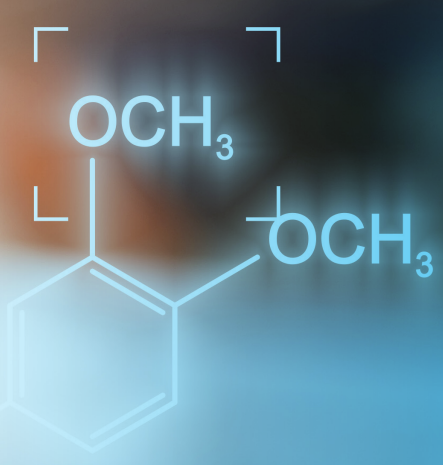
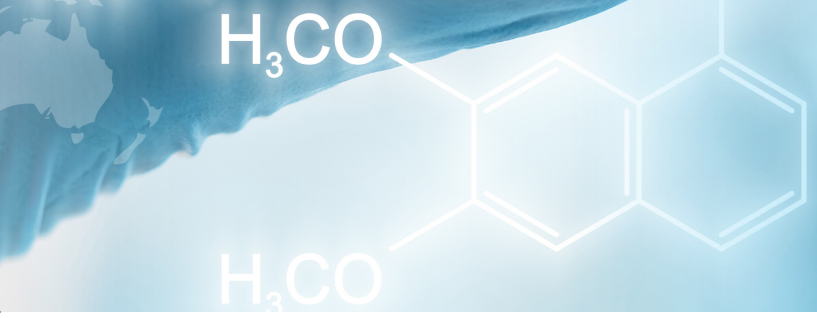
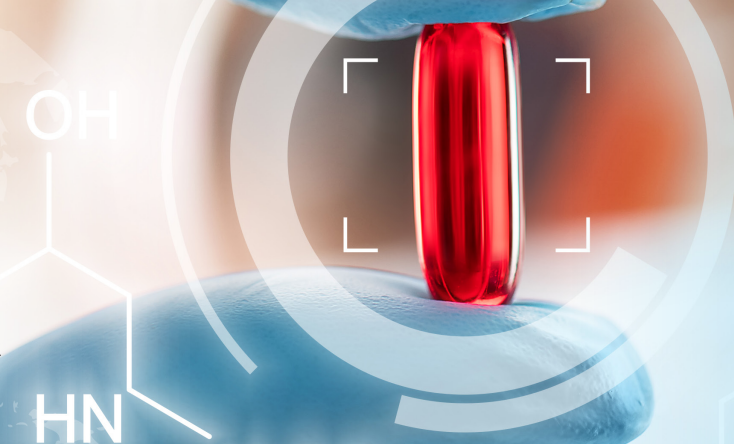
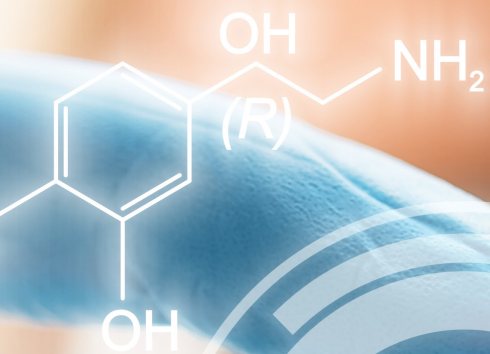


M.S. PHARMACEUTICAL SCIENCES PROGRAM



Cb = pH[H ⁺]	[OH]	Alp
7.403.98E-08	2.51E-07	0.2
7.602.51E-08	3.98E-07	0.2
8.001.00E-08	1.00E-06	0.5
8.403.98E-09	2.51E-06	0.7

A close-up portrait of a woman with dark hair and glasses, looking thoughtfully to the right. She is wearing a light blue button-down shirt. The background is a blurred laboratory setting with blue lighting. A semi-transparent white banner is overlaid across the middle of the image, containing the text 'M.S. PHARMACEUTICAL SCIENCES PROGRAM'. In the bottom right corner, there is a faint, light blue graphic of a chemical structure, specifically a benzene ring with a sphere attached to it.

M.S. PHARMACEUTICAL SCIENCES PROGRAM

PREREQUISITE COURSES

Organic Chemistry	8 credits
General Chemistry	4 credits
General Biology	4 credits
General Physics	4 credits
Precalculus or Higher Math	3 credits

This graduate degree requires an undergraduate degree in Biological or Life Sciences and a minimum of 3.2 GPA.

This 36-semester hour Master of Science degree program in Pharmaceutical Sciences at Harrisburg University consists of advanced training in characterizing drug action and disposition. Courses offered in this program will give students a broad understanding of diverse topics in pharmaceutical science that range from established paradigms to emerging technology and applications.

Scientific communication and professional development are stressed in the curriculum and reinforced through coursework and independent study. Graduates will be prepared for a career in research, industry, or continuing to a doctoral program in health sciences or healthcare.

M.S. PHARMACEUTICAL SCIENCES PROGRAM

Classes that focus on genomics and biopharmaceutics will give students perspectives on aspects of personalized medicine. This diverse curriculum will prepare graduates for careers in the expanding personalized medicine and biotechnology sectors, as well as in more traditional roles in the pharmaceutical industry. The elective options allow the student to individualize their own coursework based on their career goals.

PROGRAM GOALS

Graduates of the Master of Science in Pharmaceutical Sciences program will be able to:

- Analyze the role of core content areas in pharmaceutical science in the industrial, clinical, and regulatory spheres;
- Recommend and apply established models to predict drug dispositions in patients as part of a multidisciplinary team;
- Design strategies using scientific approaches to accomplish set pharmaceutical goals in an industry or regulatory setting;
- Evaluate primary literature relevant to pharmaceutical sciences and use that literature to solve diverse problems in pharmaceutical science; and,
- Effectively communicate pharmaceutical science information and issues from around the world, orally and written, to individuals with scientific and non-scientific backgrounds.

PROGRAM **OVERVIEW** | 36 SEMESTER HOURS

Pharmaceutical Sciences Requirements

The following courses comprise the Master of Science in Pharmaceutical Sciences – 36 semester hours. The semester hour value of each course appears in parentheses ().

PHMS CORE

COMPLETE 18 SEMESTER HOURS FROM THE FOLLOWING CORE COURSES:

IBTEC 625	Pharmacogenomics	(3)
PHAR 520	Pharmacokinetics and Pharmacodynamics	(3)
PHAR 525	Drug Metabolism	(3)
PHAR 540	Drug Transport	(3)
PHAR 635	Clinical Pharmacology	(3)
PHAR 690	Ethics and Trends in Pharmaceutical Science	(3)

PROGRAM REQUIREMENTS

- 18 Semester Hours Core Courses**
- 12 Semester Hours Electives**
- 6 Semester Hours Experiential Learning**

PHMS ELECTIVES

COMPLETE 12 SEMESTER HOURS FROM THE FOLLOWING ELECTIVES:

BTEC 508	Omics for Life Sciences	(3)
BTEC 540	Biostatistics	(3)
BTEC 610	Advanced Topics in Drug Discovery and Delivery	(3)
BTEC 612	Regulatory Affairs in Life Science Industries	(3)
BTEC 634	Healthcare Economics	(3)
MATH 510	Applied Statistical Methods	(3)

EXPERIENTIAL LEARNING

COMPLETE 6 SEMESTER HOURS

GRAD 695	Research Methodology and Writing	(3)
PHAR 699	Applied Project in Pharmaceutical Sciences or	(3)
GRAD 699	Graduate Thesis	(3)

COURSE DESCRIPTIONS

BTEC 625 Pharmacogenomics | 3 Semester Hours

Prerequisites | Bachelor of Science degree in Biotechnology, Life Science or other relevant field or by permission of instructor

Description | The genetic basis of variability in drug response can contribute to drug efficacy and toxicity, adverse drug reactions and drug-drug interactions. Healthcare professionals need an understanding of the genetic component of patient variability to deliver effective individualized pharmaceutical care. This course offers an introduction to the evolution of pharmacogenetics/pharmacogenomics, the human genome and modern applications of DNA information related to diagnostics, drugs and therapeutics. Emphasis is placed on concepts and methodologies for using an individual's genetic make-up to determine that individual's predisposition towards diseases and ability to respond to drugs. Understanding of the basics of pharmacogenomics enables the student to better understand and manage the new genomics based tools and make best treatment choices.

PHAR 520 Pharmacokinetics and Pharmacodynamics | 3 Semester Hours

Prerequisites | A Bachelor of Science degree in Health Science

Description | This course introduces students to the principal factors that can impact absorption, distribution, and elimination of drugs in the body. Specifically, mathematical approaches to characterizing pharmacokinetics (PK), the study of factors influencing drug concentrations in the body, and pharmacodynamics (PD), the study of the physiologic action of drugs in the body, will be discussed with an emphasis on small molecule and protein therapeutics. The clinical and non-clinical applications of PK and PD will be discussed. Students will participate in simulations of real-world pharmacokinetic monitoring of various drugs used clinically to treat infections, control seizures, and suppress arrhythmias.

PHAR 525 Drug Transport | 3 Semester Hours

Prerequisites | A Bachelor of Science degree in Life Science

Description | This course covers multiple aspects of drug transport, from simple diffusion to protein-mediated active transport of drugs and other xenobiotics. Specific transporters will be discussed in the context of clinical and pre-clinical effects on drug disposition. Distribution, substrates, and mechanisms of relevant drug transporters will be discussed, as well as how they can mediate potentially toxic effects of drugs.

PHAR 540 Drug Metabolism | 3 Semester Hours

Prerequisites | PHAR 520

Description | This course focuses on multiple aspects of drug metabolism. Specific content includes instruction on phase 1 and phase 2 drug metabolism. While the majority of the course will involve examining hepatic drug metabolism and extrahepatic metabolic pathways, drug metabolism in preclinical drug development will also be covered. This course will also expose students to the role drug metabolism plays in potentially toxic drug effects and interactions.

PHAR 635 Clinical Pharmacology | 3 Semester Hours

Prerequisites | Bachelor of Science degree in Biotechnology, Life Science, or other relevant field or by permission of instructor

Description | Clinical pharmacology deals with drug development and drug utilization in therapeutics. This course covers the advancements regarding drug action and efficacy. Concepts of pharmacokinetics, drug metabolism and transport, pharmacogenetics, assessment of drug effects, and drug therapy in special populations are explored. Expert knowledge is shared about drug development and content specialization needed to stay competitive and build opportunity for career options.

PHAR 690 Ethics and Trends in Pharmaceutical Science | 3 Semester Hours

Prerequisites | To be taken in second year of Pharmaceutical Sciences program

Description | Ethics and Trends in Pharmaceutical Science presents current challenges, trends, and controversies concerning pharmaceutical science. Lectures will be generally composed of presenting current (within the calendar year) articles from around the world that introduce a topic of interest. Such topics may include industry news, education trends, and regulatory controversies.

PHAR 699 Applied Project in PHAR | 3 Semester Hours

Prerequisites | GRAD 695 and permission of instructor

Description | This course allows the student to pursue an area of interest that is within the broad scope of Pharmaceutical Science. A faculty member will supervise this study.

Harrisburg University serves more than 5,300 students annually from 103 different countries. Seventy percent of students are international.

- CPT Eligible
- Offered Executive Format
- Offered Online

GRADUATE COURSE DELIVERY MODEL

Executive Format | 12 hours of instruction in class. Delivered over 3 Saturdays (1 day early in the beginning of the semester, 1 day in middle, and 1 day at the end of semester). Asynchronous instructions, assignments, and discussion forum. Online synchronous discussion sessions (1 hour per week).

Online for Non-International Students | No in-class sessions. Asynchronous instructions, assignments, discussion forums. Online synchronous discussion sessions (1 hour per week).

Online for International Students | In-class sessions meet once a month. Asynchronous instructions, assignments, discussion forums. Online synchronous discussion sessions (1 hour per week).

For more information email Masters@HarrisburgU.edu

NON-INTERNATIONAL STUDENTS

This degree program can be completed all online.

INTERNATIONAL STUDENTS

The University has created a streamlined process for accepting international student applications. Email: CPT@HarrisburgU.edu and a custom application will be sent. Complete the scanned application and return it via email with copies of the following documents:

- Goal Statement
- Transcripts
- Visa/Passport
- Resume/Vita
- Affidavit of Financial Support
- Letters of Recommendation
- TOEFL, IELTS or GRE Score

Apply today at <http://www.HarrisburgU.edu/Apply>



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& technology-based master's degrees offered at
Harrisburg University, visit www.HarrisburgU.edu**

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