

PHARMACEUTICAL SCIENCES AND DRUG DESIGN M.S.

Program Overview

The Graduate Program in Pharmaceutical Sciences and Drug Design provides advanced training in basic, translational, and clinical research within the pharmaceutical sciences and prepares students for career opportunities in academia, pharmaceutical and biotechnology industries, and governmental agencies. It is one of five programs coordinated through the Molecular and Biomedical Sciences Umbrella (<https://www.umt.edu/molecular-biological-sciences/>).

The Pharmaceutical Sciences and Drug Design program is aimed at designing effective new drug therapies while minimizing adverse effects. Research in the program includes a diverse range of therapeutic areas including cancer, cardiovascular, dermatological, immune-mediated, neurological, and psychiatric diseases. Students receive didactic and laboratory training in the design and development of pharmacological compounds including the disciplines of molecular and cellular pharmacology (drug target and biomarker discovery), medicinal chemistry (drug design and synthesis), pharmacokinetics (drug absorption, distribution, metabolism, and elimination), pharmaceutics (drug delivery and formulation), pharmacogenomics (genetic basis for drug response) and toxicology (drug-induced toxicity). A unique feature of the PSDD program a focus on health equity for rural and underserved populations.

The Graduate Program is highly collaborative within the broader University of Montana research community with diverse opportunities for study and research at the interface of chemistry, biochemistry, cell and structure biology, computation, and genetics with emphases on issues of pharmaceutical and biomedical importance. Faculty in the program are also closely aligned with several multidisciplinary research Centers and Institutes at the University of Montana including the Center for Biomolecular Structure and Dynamics (<https://www.umt.edu/center-biomolecular-structure-dynamics/>), the Center for Environmental Health Sciences (<https://cehsweb.health.umt.edu/>), the Center for Structural for Functional Neuroscience (<https://www.umt.edu/center-structural-functional-neuroscience/>), the Montana Biotechnology Center (<https://www.umt.edu/montana-biotechnology-center/>), and the L.S. Skaggs Institute for Health Innovation (<https://www.umt.edu/skaggs-institute-health-innovation/default.php>).

Dual Degree in the Doctor of Pharmacy and the M.S. in Pharmaceutical Sciences and Drug Design

Students have the option of completing a dual-degree pathway toward the Doctor of Pharmacy (<http://catalog.umt.edu/colleges-schools-programs/health/skaggs-school-of-pharmacy/doctor-of-pharmacy/>) and the M.S. in Pharmaceutical Sciences and Drug Design. This pathway allows students to substitute coursework taken as part of the Doctor of Pharmacy program for requirements in the M.S.

Master of Science - Pharmaceutical Sciences and Drug Design

Degree Specific Credits: 30

Required Cumulative GPA: 3.0

Graduate students will rotate through the laboratories of at least two faculty members during their first year in the program, after which students will choose a faculty research advisor, advisory committee, and a thesis research project.

Required Courses

Note: Specialized electives chosen based on research interests may include classes offered in the departments of Biomedical and Pharmaceutical Sciences, Chemistry and Biochemistry, and the Division of Biological Sciences.

Code	Title	Hours
Complete all of the following courses:		
BMED 545	Research Lab Rotations in Pharmaceutical Sciences	2
BMED 594	Seminar	1
BMED 609	Biomedical Statistics	3
BMED 615	Molecular Pharmacology	3
BMED 621	Drug Design	3
BMED 632	Advanced Pharmacokinetics	4
BMED 637	Topics in Pharmaceutical Sciences and Drug Design (1 cr. per semester)	4
BMED 597	Research (MS)	9
BMED 599	Thesis (MS)	1
Total Hours		30

Required Courses for the Doctor of Pharmacy and M.S. in Pharmaceutical Sciences and Drug Design Dual-Degree Program

Dual degree Pharm.D./M.S. students are usually able to complete degree training within the time period of the Doctor of Pharmacy (<http://catalog.umt.edu/colleges-schools-programs/health/skaggs-school-of-pharmacy/doctor-of-pharmacy/>) degree.

Students in this program may also optionally take PHAR 588, allowing students time to write and defend their thesis or professional paper.

Code	Title	Hours
Complete all of the following courses:		
BMED 594	Seminar	1
BMED 637	Topics in Pharmaceutical Sciences and Drug Design (1 cr. per semester)	4
PHAR 421	Medicinal Chemistry I	3
PHAR 422	Medicinal Chemistry II	3
PHAR 443	Pharmacology & Toxicology I	4
PHAR 444	Pharmacology & Toxicology II	4
PUBH 520	Fundamentals of Biostatistics	3
BMED 597	Research (MS)	9
BMED 599	Thesis (MS)	1
Total Hours		32