



**COLLEGE OF
PHARMACY**

UNIVERSITY OF MICHIGAN

**Master of Science in
Integrated Pharmaceutical Sciences**

MSIPS Handbook

Overview

Welcome! The [Master of Science in Integrated Pharmaceutical Sciences](#) (MSIPS) program prepares students desiring expertise in drug discovery, drug delivery, and drug utilization. The foundation of the M.S. program is coursework offered by three academic programs in the College of Pharmacy – Medicinal Chemistry, Pharmaceutical Sciences, Clinical Pharmacy Translational Sciences – resulting in an integrated program.

- [Medicinal Chemistry](#) involves the application of a number of specialized disciplinary approaches all focused on the ultimate goal of drug discovery. Drug target identification and validation, rational (target-based) drug design, structural biology, computation-based drug design, methods development (chemical, biochemical, and computational), and “hit-to-lead” development are all aspects of medicinal chemistry. The techniques and approaches of chemical biology, synthetic organic chemistry, combinatorial (bio)chemistry, mechanistic enzymology, computational chemistry, chemical genomics, and high-throughput screening are all used and applied by medicinal chemists towards drug discovery.
- [Pharmaceutical Sciences](#) is a dynamic and interdisciplinary field that aims to integrate fundamental principles of physical and organic chemistry, engineering, biochemistry, and biology to understand how to optimize delivery of drugs into the body and translate this understanding into new and improved therapies against human disease. The faculty contribute to the field through inquiry into the underlying mechanisms of drug interactions with the human body and the development of synthetic and biologically-derived materials that modulate these interactions to produce safer and optimized therapies and drug products.
- [Clinical Pharmacy Translational Sciences](#) is “that area of pharmacy concerned with the science and practice of rational medication use (ACCP).” Faculty in the clinical pharmacy translational sciences work within two broad areas including precision pharmacotherapy and health services research. Precision pharmacotherapy researchers focus on the discovery and translation of physiological biomarkers that can be used to predict, monitor, or understand treatment outcomes. Health services research faculty focus on how health policy and our health systems and providers impact medication use and treatment outcomes.

Curriculum

The MSIPS curriculum is highly flexible and offers students a wide variety of graduate-level courses from which to choose. Under the guidance of a faculty advisor assigned by your track, students tailor their educational and research experiences in preparation for the next stage of their

academic training or professional career. The program is a residential, full-time master's degree requiring **32 total credit hours** (24 credits of coursework, 8 credit capstone).

Required Coursework (24 credits)

College of Pharmacy – Our three academic areas (Medicinal Chemistry, Pharmaceutical Sciences, Clinical Pharmacy Translational Sciences) offer foundational courses and weekly scientific seminars. All students must complete at least **16 credits** of coursework offered through the College of Pharmacy. Students are expected to choose coursework from the approved list below with offerings in each track area (13 credits); there is also a required 1-credit ethics requirement (MEDCHEM 660) and 2 credits of required seminar (INTPHARM 750), totaling 16 credits.

Approved List:

- CPTS 820, 824, 832, 834; 822, 830
- MedChem 532, 533; 534, 535
- PharmSci 700, 701, 702, 703, 704, 706; 705, 707, 710, 717, 760
- Pharm 647, Intpharm 700, Intpharm 571

U-M Electives – The remaining **8 credits** may be from either additional College of Pharmacy department coursework or coursework from other University of Michigan departments such as BioChem, BioMed, BioStats, CancBio, Chem, Epid, Immun, MatSci, MicroBio, Physiol, and Stats. Explore what the University of Michigan has to offer at the graduate level!

Note: Courses that will not count as U-M Electives are department seminars like CPTS 850 and PS 838, ELI and PharmD courses, early Capstone registration, audited courses, and undergraduate courses not approved for graduate credit.

Capstone Project (8 credits)

Students must complete a capstone research project (or approved internship) under the guidance of a College of Pharmacy faculty member in your track area. The capstone project is usually done in the final Spring/Summer semester for **8 credits** (INTPHARM 790) over 14 weeks, requiring a full-time commitment. At the end of the summer, the cohort is expected to give a presentation at our annual symposium and submit a written report & poster.

The requirement for hours worked during spring/summer term for 8 credit hours of 790 are as follows:

- One (1) credit hour of independent study/research = 3-4 hours/week of work. For 8 credit hours the expectation is 24-32 hours/week of work, with no less than a total of 336 hours worked for the full (spring/summer) semester. You are required to work with your faculty advisor to keep track of your hours worked for the full spring/summer term to ensure you meet the work hours total for the term.

Students who would like to work with external U-M faculty (faculty who are not members of the College of Pharmacy) must seek approval from the MSIPS committee. If an external faculty member is approved to serve as a student's capstone advisor, a College of Pharmacy faculty

member will serve as the lead for the capstone project (responsible for entering the final grade) with the external U-M faculty as the capstone mentor.

Faculty mentors for MSIPS research projects will receive a one-time transfer of up to \$1,250 to their discretionary account for each student mentored to support project-related expenses (\$125 for each of fall and winter optional terms mentored and \$1,000 for required spring/summer term mentored).

Curriculum Resources

Below are sample curricula for both even and odd admissions years. Course availability will vary depending on the year of admission. A list of course descriptions for the U-M College of Pharmacy can be found [HERE](#). The degree worksheet linked below will help you to plan your degree.

Coursework Policies

Courses taken in fulfillment of Rackham degree requirements must be approved for Rackham graduate credit.

Course that may not be used for graduate credit:

- Courses at the 300 level or below
- Courses at the 400 level that are not approved for graduate credit
- Department seminars like CPTS 850 and PS 838
- Courses taken as visitor (auditor) rather than for credit
 - *Note: These courses are not calculated as part of the GPA if completed successfully. A student who fails to complete the course successfully, however, will receive a grade of "E" (failure) which is calculated as part of the GPA.*
- College of Pharmacy PharmD classes
 - *Note: Course descriptions, available through the College of Pharmacy website, will confirm the student audience as PharmD.*
- English Language Institute Courses
 - *Note: May be taken for credit but do not count towards the 24 credit hours required for this degree.*
- ClinPharm 570, MedChem 570, PharmSci 570, IntPharm 789
 - *Note: Registration in these courses is limited to 1-2 credits hours during the fall and winter terms. These courses do not count towards the required coursework. Additionally, these courses indicate that your capstone research with a faculty mentor has started. Registration in these courses does not change the work expectation for the total credits to be registered in the springs/summer term.*

Capstone Project Guidelines

Based on the “Proposal for Master of Science in Integrated Pharmaceutical Sciences” approved by Rackham and the College of Pharmacy faculty as described below, the following process will be used to review Capstone proposals and final reports.

Winter Term

1. Apply for graduation in Wolverine Access for Summer/August degree completion.
2. Upload Capstone Research Proposal to the Interpharm 750 Canvas site
 - The MSIPS Faculty Director and the MSIPS Committee will review the proposals for quality and consistency.
3. Adjust proposal as recommended by the MSIPS Faculty Director and Committee. Begin planning project with Faculty Capstone Mentor.
4. Register for the Interpharm 790 course (8 credits) for the Spring/Summer term. You will receive an email with permission to enroll in the 790 section of your faculty mentor. You need to manually enter “8” credits when registering. Email cop.registrar@umich.edu if you have questions.

Spring/Summer Term

1. Active work towards completion of project with Faculty Capstone Mentor.
2. Prepare a poster and a comprehensive paper summarizing the relevant literature of the chosen topic, methods used, results obtained, conclusions, and perspectives for future research (must be reviewed and approved by faculty mentor).
 - Format is to be determined by the faculty mentor (suggested format for the paper is a manuscript publication; approximately 20 pages plus figures, tables, and references). It is anticipated that this paper may be submitted for publication, but it is not required.
3. Give an oral presentation summarizing Capstone project at the MSIPS Research Symposium in early August
4. Upload final poster and paper to the 790 Canvas site and email documents to Faculty Capstone Mentor

5. Following the completion of the project, the Faculty Mentor will assess the report and enter a grade in Wolverine Access.
 - A grade of S/U is to be assigned

In the winter term, students will be provided with a timeline for the completion of the tasks outlined above with deadlines.

Support Staff & Faculty Advisors

Sneha Strodel – Student Affairs Program Manager (general questions)
 Antoinette Hopper – Student Affairs Program Manager (professional development, workshops)
 Nick Ragazzone – Student Affairs Program Manager (medicinal chemistry questions, PhD prep)
 Crystal Gregory – Assistant Director of Student Services (degree audit questions)
 Eileen Brussolo – Student Affairs Program Manager (financial aid/tuition questions)

KD Lee – MSIPS Faculty Chair & Professor of Pharmaceutical Sciences
 James Moon – Professor of Pharmaceutical Sciences
 Dan Hertz – Professor of Clinical Pharmacy
 Haojie Zhu – Professor of Clinical Pharmacy and Pharmaceutical Sciences
 Nouri Neamati – Professor of Medicinal Chemistry

Student Billing & Financial Aid

Financial support for the master's program is provided through sources obtained by the student (Federal Student Aid, private loans, and external scholarships). We encourage interested applicants to complete the Free Application for Federal Student Aid (FAFSA) in order to determine their eligibility for student financial aid. The College of Pharmacy does not offer financial aid for students in the master's program. The University of Michigan offers an optional payment plan which allows you to spread the payment of anticipated educational expenses for fall or winter term over five payments. More information can be found at <http://www.finance.umich.edu/finops/student/um-payment-plan>.

This master's program requires the payment of three terms of tuition and fees (fall, winter, & spring/summer). Tuition costs can be reviewed at <https://ro.umich.edu/tuition-residency/tuition-fees>. In the tuition & fees search, make the following selections:

- **Academic year:** (choose the current academic year)
- **College/School:** College of Pharmacy
- **Full or Half Term:** Full Term
- **Level of Study:** Graduate

Your rates will be listed under the following:

- Rackham Tuition

- Michigan Resident or Non-Resident
- Mandatory Fees
- International Student Fee

For information regarding your student account, billing due dates, and payment methods accepted by the University of Michigan: <http://www.finance.umich.edu/finops/student/billing>

International Center

The [International Center](#) (IC) serves our international MSIPS students, facilitates intercultural and international education, and fosters a global campus community at the University of Michigan and beyond.

The IC plays a significant campus-wide role as the central administrative unit, charged with providing advice and counsel on U.S. immigration regulations and compliance, per the University's Standard Practice Guide. They work with international students and their families (dependents) in several non-immigrant visa categories.

Through an array of programming, the IC guides international students through U.S. culture and encourages them to become involved in campus life.

Students with Disabilities

Diversity, equity, and inclusion are important to the College of Pharmacy. To assist MSIPS students with disabilities, the College of Pharmacy partners with Services for Students with Disabilities (<https://ssd.umich.edu>) and the Rackham Graduate School (<https://rackham.umich.edu/rackham-life/students-with-disabilities/>) to implement disability accommodations and services. Examples of reasonable accommodations include, but are not limited to: note taking services, captioning, interpreter services, and adjusting time limits on tests.

The Rackham Graduate School

The role of the Rackham Graduate School is to:

- Ensure the quality of graduate education
- Encourage innovation and effective practices
- Build a vibrant and diverse student community

Rackham provides a wide array of resources, events, and programming designed to contribute to the academic and professional development of graduate students. In addition, it serves as a governing body that ensures consistent standards in admissions, registration, degree requirements, and the awarding of degrees. The College of Pharmacy has additional

requirements and rules. Students are expected to be familiar with the policies of the Graduate School, the College of Pharmacy, and their individual degree programs.

The Rackham Graduate School updates its [academic policies](#) annually and makes them available on the Graduate School website on the “Navigating Your Degree” web page. In the event of any discrepancies, the version published on the Rackham website is the authoritative version.

The following academic policies are addressed in [Rackham’s academic policies handbook](#):

- Admissions, Matriculation, and Tuition
- Registration
- Coursework, Grading and Academic Standing
- Master’s Degree Requirements
- Dual Degree Requirements
- Certificates of Graduate Studies Programs
- Rackham Academic and Professional Integrity Policy
- Academic Dispute Resolution Policy and Procedures
- University policies on Rights, Integrity, and Conduct

Rackham Resolution Officer

The Rackham Resolution Officer provides a safe and confidential environment to discuss concerns and advises faculty, postdoctoral fellows, staff, and students on matters related to emergencies, crisis situations, disputes, and student conduct violations (source: <https://rackham.umich.edu/about/directory/resolution-officer/>).

In the College of Pharmacy, the Rackham Resolution Officer is Mark Nelson. Dean Nelson is located in the Academic and Student Affairs office. He works with the Resolution Officer located at the Rackham Graduate School to review and resolve matters that need to be escalated to authorities outside of the College.

The University has many other offices and departments dedicated to supporting students in every aspect. Learn more [here](#). You will be invited to an [MSIPS Canvas site](#) for quick access to key program information, announcements, resources.

Again, welcome to the MSIPS program! We look forward to working with you as you develop as a scholar and researcher at the master’s level at the College of Pharmacy. Go Blue!