Twin Cities Campus

Medicinal Chemistry M.S.

Graduate Studies in Medicinal Chemistry

College of Pharmacy

Link to a list of faculty for this program.

Contact Information:
Department of Medicinal Chemistry, 8-101 Weaver-Densford Hall, 308 Harvard Street SE, Minneapolis, MN 55455 (612-624-9919; fax: 612-626-3114)
Email: medchem@umn.edu
Website: http://z.umn.edu/medchemgrad

- Program Type: Master's
- Requirements for this program are current for Fall 2020
- Length of program in credits: 30
- This program does not require summer semesters for timely completion.
- Degree: Master of Science

Along with the program-specific requirements listed below, please read the General Information section of the catalog website for requirements that apply to all major fields.

Note: Students are not admitted directly to the MS program. See the Medicinal Chemistry PhD or contact the director of graduate studies for more information.

The medicinal chemistry program emphasizes the application of chemical principles to research on the action of drugs on biological systems. Courses offered by the program focus on general principles of medicinal chemistry, drug design and synthesis, chemical aspects of drug metabolism, chemical mechanisms of drug toxicity and carcinogenicity, computer-assisted drug design and receptor modeling, and combinatorial chemistry.

Students must complete a core curriculum of advanced courses in organic and medicinal chemistry, as well as credits in a minor or related field.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Prerequisites for Admission

The preferred undergraduate GPA for admittance to the program is 3.00.

Special Application Requirements:
Note: Students are not admitted directly to the M.S. program. See the Medicinal Chemistry Ph.D.

For an online application or for more information about graduate education admissions, see the General Information section of the catalog website.

Program Requirements

Plan A: Plan A requires 20 major credits, up to null credits outside the major, and 10 thesis credits.The final exam is oral.

Plan B: Plan B requires 30 major credits and up to null credits outside the major.The final exam is oral.

This program may be completed with a minor.

Use of 4xxx courses toward program requirements is permitted under certain conditions with adviser approval.

A minimum GPA of 3.00 is required for students to remain in good standing.

At least 1 semesters must be completed before filing a Degree Program Form.

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Information current as of March 29, 2024

Students must take all courses for an A-F grade, unless the course is only offered on the S/N grading basis.

Required Courses (14 credits)

Take the following courses:

MEDC 8001 - General Principles of Medicinal Chemistry (3.0 cr)
MEDC 8002 - General Principles of Medicinal Chemistry (3.0 cr)
MEDC 8050 - Physical and Mechanistic Organic Chemistry (2.0 cr)
MEDC 8435 - BioAssay & Data Analysis (1.0 cr)
CHEM 8321 - Organic Synthesis (4.0 cr)
CHEM 8066 - Professional Conduct of Chemical Research (1.0 cr)

Biochemistry Requirement (2 to 4 credits)

Select one of the following 2- to 4-credit courses in consultation with the advisor. A substitute course can be selected with approval of the advisor and director of graduate studies.

BIOC 8005 - Biochemistry: Structure and Catalysis (2.0 cr)
BIOC 8006 - Biochemistry: Metabolism and Control (2.0 cr)
BIOC 5535 - Introduction to Modern Structural Biology -- Diffraction (2.0 cr)
BIOC 5528 - Spectroscopy and Kinetics (4.0 cr)
GCD 8151 - Cellular Biochemistry and Cell Biology (2.0 - 4.0 cr)
CHEM 8411 - Introduction to Chemical Biology (4.0 cr)

Additional Courses to Satisfy Elective Requirement

Select remaining courses in consultation with the advisor to complete the 20 course credits required for the Plan A, or the 30-credit requirement for the Plan B. At least one course must be selected from the following options.

MEDC 5185 - Principles of Biomolecular Simulation (3.0 cr)
MEDC 5494 - Advanced Methods in Quantitative Drug Analysis (2.0 cr)
MEDC 8070 - The Chemistry and Biology of Infectious Diseases (3.0 cr)
MEDC 8420 - Natural Products Chemistry (3.0 cr)
MEDC 8471 - High Throughput Drug Discovery (3.0 cr)
MEDC 8413 - Chemistry of Nucleic Acids (3.0 cr)
MEDC 8461 - Design of Cancer Therapeutics (3.0 cr)
MEDC 8700 - Advanced Concepts in Drug Design (2.0 cr)
MEDC 8753 - MOLECULAR TARGETS OF DRUG DISCOVERY (3.0 cr)
CHEM 8322 - Advanced Organic Chemistry (4.0 cr)
MEDC 8401 - Chemistry of Counterterrorism: Chemical, Biological, Radiological, Nuclear & High Explosive Threats (2.0 cr)

Thesis Credits

Take at least 10 masters thesis credits.

MEDC 8777 - Thesis Credits: Master's (1.0 - 18.0 cr)

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