Twin Cities Campus

Chemical Physics M.S.

Chemistry

College of Science and Engineering

Link to a list of faculty for this program.

Contact Information:
Chemical Physics Program, University of Minnesota, 137 Smith Hall, 207 Pleasant St SE, Minneapolis, MN 55455 (612-626-7444; fax: 612-626-7541)
Email: chmapply@umn.edu
Website: http://chem.umn.edu/academics/graduate/chemical-physics

- Program Type: Master's
- Requirements for this program are current for Fall 2019
- Length of program in credits: 30
- This program requires 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.

Chemical physics focuses on research areas where the techniques of chemistry and physics are combined for the study of atoms and molecules; their interactions in gases, liquids, and solids; and the detailed structure and dynamics of material changes. Areas of research and specialization include spectroscopy, optical properties, laser applications, molecular collisions, chemical dynamics, quantum mechanics, computational chemistry, statistical mechanics, thermodynamics, low-temperature behavior, polymers and macromolecules, surface science, biochemistry, and biochemical and heterogeneous catalysis.

Program Delivery

This program is available:

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

Prerequisites for Admission

An undergraduate degree in chemistry, physics or a related field is required for admission. The preferred minimum undergraduate GPA for admittance to the program is 3.2.

Other requirements to be completed before admission:
Prospective graduate students should have adequate undergraduate preparation in chemistry, physics and mathematics.

Three letters of recommendation and scores from the GRE general test are required for all applications. In addition, international applicants are expected to provide scores of at least 587 (paper), 240 (computer), or 95 (Internet) on the TOEFL.

A Subject GRE score is not required but if available will help the admission committee to make better decisions, in particular in cases where undergraduate transcripts are more difficult to evaluate (which is especially true for international applicants, who are strongly encouraged to submit the GRE subject score). The Subject GRE can be taken in Chemistry, Physics, or a related discipline.

Special Application Requirements:
Applications for fall semester must be completed by December 15 in order to be considered for financial support. Applications received after December 15 will be reviewed on a space available basis. The department prefers to admit for fall semester and will only consider spring admission under extenuating circumstances. More application information is available at www.chem.umn.edu/chemphys

Applicants must submit their test score(s) from the following:

- GRE

International applicants must submit score(s) from one of the following tests:

- TOEFL
  - Internet Based - Total Score: 95
  - Internet Based - Speaking Score: 23
- IELTS
  - Total Score: 7
- MELAB
  - Final score: 83

Key to test abbreviations(GRE, TOEFL, IELTS, MELAB).

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 written. A capstone project is required.
Capstone Project: Each Plan B project should involve a combined total of approximately 160 hours (the equivalent of four full-time weeks) of library research, reading, and/or writing resulting in the preparation of a significant written document. Students who plan to work on Plan B projects independent of the Preliminary Examination should present a plan, after consultation with the chosen instructor for the Plan B project, outlining the number and content of their projects to the director of graduate studies. Projects should be completed to the satisfaction of the instructor; the final grade is determined by the instructor.

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 2.8 is required for students to remain in good standing.

Students are expected to pass a proficiency exam in physical chemistry during their first academic year in residence.

The MS degree requires a minimum of 30 credits and is offered under Plan A (thesis) and Plan B (project). The course credits must include at least 6 credits each in chemistry (CHEM) and physics (PHYS) or at least 3 credits each in quantum mechanics, thermodynamics, and statistical mechanics.

All first-year students must register for CHPH 8601 during both fall and spring semesters and for CHEM 8066 during the spring semester of their first year in residence.

Required Courses

Any CHPH, CHEM, and PHYS courses at the 5xxx or 8xxx level may be used to satisfy degree requirements. Up to 8 credits in 4xxx-level courses may be used with approval from the director of graduate studies.
Students may count one credit each of the following towards the degree.
CHEM 8066 - Professional Conduct of Chemical Research (1.0 cr)
CHPH 8601 - Seminar: Modern Problems in Chemical Physics (1.0 cr)

Plan A

Plan A requires 20 course credits and 10 thesis credits.
CHPH 8777 - Thesis Credits: Master's (1.0 - 18.0 cr)

Plan B

Plan B requires 30 credits of coursework, including 8 credits in the two Plan B project courses.
CHPH 8081 - M.S. Plan B Project I (4.0 cr)
CHPH 8082 - M.S. Plan B Project II (4.0 cr)