UNIVERSITY OF MINNESOTA
Driven to Discover℠

Twin Cities Campus

Chemical Physics Ph.D.

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: Doctorate
- Requirements for this program are current for Fall 2017
- Length of program in credits: 48
- This program requires summer semesters for timely completion.
- Degree: Doctor of Philosophy

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 program 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

© 2005 by the Regents of the University of Minnesota
The University of Minnesota is an equal opportunity educator and employer.
Information current as of March 29, 2024

- 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

24 credits are required in the major.
24 thesis credits are required.

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.

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

Each first-year chemical physics student will choose a program of study in consultation with his or her TMC (three-member committee).

The 24 course credits required must include either:

(a) at least 5 credits in chemistry (CHEM) and at least 5 credits in physics (PHYS), or
(b) at least 16 credits in chemistry and/or physics combined, including at least 5 credits of quantum mechanics and at least 5 credits chosen from among the areas of thermodynamics, statistical mechanics, statistical physics, and chemical dynamics.

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 1 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)

Thesis Credits

Take 24 credits after passing preliminary oral exam.
CHPH 8888 - Thesis Credit: Doctoral (1.0 - 24.0 cr)

© 2005 by the Regents of the University of Minnesota
The University of Minnesota is an equal opportunity educator and employer.
Information current as of March 29, 2024