

DEPARTMENT OF CHEMISTRY

Graduate Study

The Department of Chemistry offers the Doctor of Philosophy degree. The subjects offered aim to develop a sound knowledge of fundamentals and a familiarity with current progress in the most active and important areas of chemistry. In addition to studying formal subjects, each student undertakes a research problem that forms the core of graduate work. Through the experience of conducting an investigation leading to the doctoral thesis, a student learns general methods of approach and acquires training in some of the specialized techniques of research.

The areas of research (<https://chemistry.mit.edu/areas-of-research>) in the department include chemical biology, environmental, inorganic, materials, organic and physical chemistry, broadly defined. Chemical research frequently involves more than one of the traditional subfields. Some research activities of the department are carried out in association with interdisciplinary laboratories and centers (<https://catalog.mit.edu/mit/research>) as described in Research and Study. These interdisciplinary research laboratories provide stimulating interaction among the research programs of several MIT departments and give students opportunities to become familiar with research work in disciplines other than chemistry. The department also participates in the interdisciplinary graduate Program in Polymers and Soft Matter, the Biotechnology Training Program, the Microbiology Program, and the Biophysics Certificate Program.

Admission Requirements for Graduate Study

Students intending to do graduate work in the Chemistry Department should have excellent undergraduate preparation in chemistry. The department is flexible with respect to specific course preparation; the essential requirement is demonstration of ability to progress with advanced study and research in some area of special interest. However, mathematics and physics are important prerequisites for graduate work in physical chemistry or chemical physics, whereas less preparation in these areas is required for work in organic chemistry.

Doctor of Philosophy

The Chemistry Department does not have any formal subject requirements for the doctoral degree. Each student, with the advice of a research supervisor, pursues an individual program of study that is pertinent to the student's long-range research interests. All students are required to serve as a teaching assistant for two terms, usually during the first year.

During the first term of residence, all graduate students are encouraged to select research supervisors who serve as their advisors for the balance of their graduate careers. In particular, the overall program of graduate subjects is established by each

student in consultation with the research supervisor. In planning this program and in establishing the thesis problem, careful consideration is given to the candidate's academic record and professional experience, as well as to long-range objectives.

A comprehensive oral examination in the candidate's major field of advanced study is held generally in the fourth term of residence. Progress in the student's research is also examined at that time. Fulfillment of the written examination occurs in conjunction with the oral examination and involves the preparation and submission of a formal document summarizing the dissertation project and progress to date. A final oral presentation on the subject of the doctoral research is scheduled after the thesis has been submitted and evaluated by a committee of examiners.

Interdisciplinary Programs

Polymers and Soft Matter

The Program in Polymers and Soft Matter (PPSM) (<http://polymerscience.mit.edu>) offers students from participating departments an interdisciplinary core curriculum in polymer science and engineering, exposure to the broader polymer community through seminars, contact with visitors from industry and academia, and interdepartmental collaboration while working towards a PhD or ScD degree.

Research opportunities include functional polymers, controlled drug delivery, nanostructured polymers, polymers at interfaces, biomaterials, molecular modeling, polymer synthesis, biomimetic materials, polymer mechanics and rheology, self-assembly, and polymers in energy. The program is described in more detail (<https://catalog.mit.edu/interdisciplinary/graduate-programs/polymers-soft-matter>) under Interdisciplinary Graduate Programs.

Financial Support

First-year graduate students are usually supported by a combination of departmental fellowships and research assistantships while they complete the academic teaching requirement. Most students receive appointments to research assistantships after their first year, and departmental fellowships are also available. Financial support after the first academic year is subject to the availability of funds and provided for students who maintain a satisfactory record.

Inquiries

Correspondence about the graduate program or appointments should be addressed to the Chemistry Education Office, Room 6-205, 617-253-1851.