

MASTER OF CHEMISTRY IN MATERIALS CHEMISTRY

Materials are chemical substances that have broad technical applications or have potential for such applications. And they are just about everywhere; from water softeners to smoke/fire detectors, gas sensors, batteries, solar panels, catalytic converters, artificial hips and joints, life-saving medicines, memory cards, computer chips, and superconductors are all products of materials. Advancement in the science and technology of making newer and more efficient materials, which have greatly enhanced the quality of our lives and will continue to do so, is intimately and ultimately connected with finding sustainable solutions to many contemporary problems facing industry and society. Chemical sciences occupy a central place in the design and development of these advanced functional materials.

The professional master's program in materials chemistry is available online and hybrid (on-line and on-campus) for both part-time and full-time students who wish to broaden and deepen their background in science of materials. The program includes modern design and synthesis strategies and innovative characterization techniques to study various types of functional materials and advanced chemical systems. Uniquely, the program combines the rigors of science education with business principles, such as project management, communication, and intellectual property management.

This innovative program seeks to prepare graduates for various science careers in industry, business, government, academic or nonprofit sectors as a new generation of professionals who can operate effectively across disciplinary boundaries. It is designed for professionals, seeking career advancement, and for recent graduates, looking to gain a competitive edge in the job market. It offers opportunities for the existing industrial workforce to remain competitive and mid-career professionals re-entering the workforce.

Courses are offered in fall, spring, and summer and conveniently scheduled during days and evenings. The degree program can be completed in two-and-a-half years for part-time study or as short as one-and-a-half years for full-time students. The graduate certificate can be completed in one year. Other than admission and career counseling, the program director provides academic advising and monitors the progress of each student from the beginning to the graduation.

Admission

Applicants are evaluated on an individual basis but are expected to hold a bachelor's degree in science or engineering with at least two semesters of organic chemistry and two semesters of calculus. The academic adviser will assist students in determining whether any prerequisites are necessary.

Applicants are required to submit transcripts, one letter of recommendation, an application fee, and a professional statement. GRE scores are required for international students, domestic students with an undergraduate GPA between 2.5 and 3.0, or at the request of the admissions committee. The minimum GRE score for admissions consideration is 300 (quantitative + verbal) and 2.5 (analytical writing).

A final comprehensive examination is required for graduation. This program is also available on the web. Students should consult iit.edu/chemistry or go to <https://www.iit.edu/academics/programs/materials-chemistry-mas> for more information.

Curriculum

| Code | Title | Credit Hours |
|---|--|--------------|
| Required Courses | | (18) |
| CHEM 505 | Spectroscopic Methods I | 3 |
| CHEM 509 | Physical Methods of Characterization | 3 |
| CHEM 521 | Structural Inorganic and Materials Chemistry | 3 |
| CHEM 522 | Efficient Chemical and Materials Synthesis | 3 |
| CHEM 535 | Polymer Synthesis | 3 |
| SCI 511 | Project Management | 3 |
| Elective Courses | | (14) |
| Select a minimum of fourteen credit hours from the following: | | 14 |
| CHEM 454 | Computational Quantum Chemistry | 3 |
| CHEM 455 | Advanced Organic Chemistry | 3 |
| CHEM 470 | Introduction to Polymers | 3 |
| CHEM 513 | Statistics for Analytical Chemists | 3 |
| CHEM 519 | Good Manufacturing Practices | 3 |
| CHEM 520 | Advanced Inorganic Chemistry | 3 |
| CHEM 524 | Synthesis and Intellectual Property Management | 2 |
| CHEM 530 | Organic Reaction Mechanisms | 3 |
| CHEM 531 | Tactics in Organic Synthesis | 3 |

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| CHEM 539 | Introduction to Pharmaceutical Chemistry | 3 |
| CHEM 542 | Polymer Characterization and Analysis | 3 |
| CHEM 544 | Colloids and Colloid Analysis | 2 |
| CHEM 548 | Electrochemical Methods | 3 |
| SCI 522 | Public Engagement for Scientists | 3 |
| Total Credit Hours | | 32 |