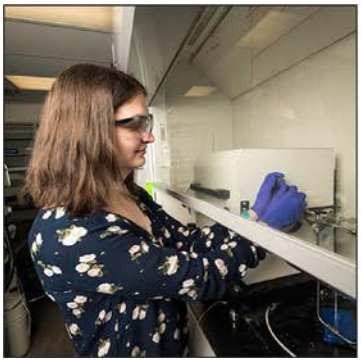
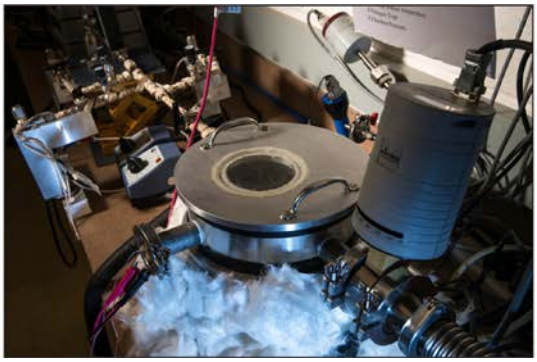
CHEMICAL ENGINEERING

HAJIM SCHOOL OF ENGINEERING & APPLIED SCIENCES
UNIVERSITY of ROCHESTER

MS in Chemical Engineering


About the MS in Chemical Engineering

The Master of Science degree in chemical engineering gives students the choice of two options:

- Plan A: Thesis-based independent research and coursework
- Plan B: Coursework-based with optional research

The curriculum is designed to develop fundamental knowledge in the chemical engineering core areas (thermodynamics, transport and kinetics), while research opportunities are available in advanced materials, catalysis, biotechnology, functional interfaces, electrochemistry and theory and simulation through faculty-run research groups.

Successful completion of an MS degree in chemical engineering typically leads to high-level professional positions or continuing on to a PhD degree. The median salary for chemical engineers with a bachelor's degree is $110,000, and with a **master's degree** is **$140,000** (source: 2019 AIChE Salary Survey).

Recent graduates from the MS program currently hold positions in places like Northrop Grumman, St. Gobain, IBM, GlobalFoundries, Exxon-Mobil, 3M, and Stanford University.

Choose Your Path		Plan A Thesis Option	Plan B Coursework Option
Approx. Duration		2 Years	1.5 Years
Total Credit Hours		30	32
Credits	**Core Courses**	16	16
	Electives	2 – 4	8 – 16
	Research	10 – 12	Optional, up to 8
Completion of		Written Thesis and Oral Defense	Oral Exam

APPLY

Academics

Plan A, Thesis Option (30 Credit Hours): Students pursuing the thesis-based MS degree are expected to earn 30 credit hours, with at least 18 credit hours from graduate level coursework. Students who choose this option must also satisfactorily complete their master's thesis and pass an oral defense. Most students complete the Plan A program in two years.

Plan B, Coursework Option (32 Credit Hours): Students who pursue the coursework-based MS degree must earn a minimum of 32 graduate credit hours. At least 18 credits should be courses within the chemical engineering department. Students who choose this option are required to pass an oral exit exam. Most students complete the Plan B program in a year and a half.

Core Curriculum

All students in the MS program must complete the following four core courses, comprising 16 credits:

Fall	Spring
CHE 400: Applied Boundary Value Problems	CHE 461: Advanced Kinetics and Reactor Design
CHE 441: Advanced Transport Phenomena	CHE 485: Thermodynamics and Statistical Mechanics

For more information on the specific program requirements, please see our Graduate Handbook. For an up-to-date list of currently offered courses and electives see our Course Catalog.

Graduate Courses

Please click here for the complete list of graduate courses in Chemical Engineering.

Advisors

For first-year MS students, academic advisors are assigned by the Graduate Student Committee. If a student decides to choose the research-based Plan A program, the selected research advisor becomes your academic advisor. Students should select a research advisor by the end of their first fall semester.

How to Apply

For information about applying for admission and for financial aid visit the applying page. Students should hold a BS in chemical engineering or a closely related field. Applicants can be eligible for up to a 40 % tuition waiver through the Dean's Office. Please contact Vicki Heberling for an application fee waiver.

APPLY

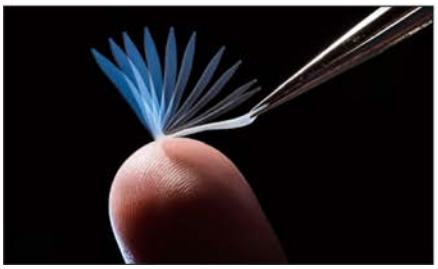
Graduate Student Association

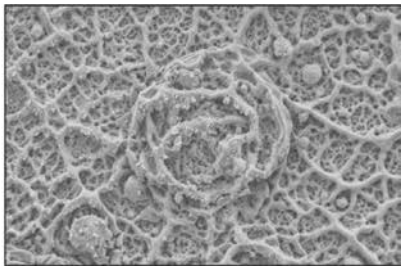
The website of the University of Rochester Graduate Student Association can be found here.

Optional Clusters

The MS in Chemical Engineering program also offers an Advanced Materials Cluster and a Sustainable Energy Cluster to students who seek to get a more in-depth knowledge in a particular area of chemical engineering. After finishing one of the clusters, the students will be issued a certificate of completion by the Hajim School of Engineering & Applied Sciences.

Advanced Materials Cluster





The Advanced Materials Concentration of the Chemical Engineering MS program provides training in modern materials engineering and solid-state fundamentals. It is tailored for students who seek careers in the ever-growing field of advanced functional materials. Courses focus on nanomaterials technology, semiconductors, polymers, biomaterials, electronic, magnetic, and optical materials, energy materials, interfaces, mechanical properties of materials, and modern materials characterization methods.

To complete the Advanced Materials Cluster, students are required to select from the following electives in addition to the MS core classes in thermodynamics, kinetics, transport phenomena and advanced mathematics

Advanced Materials Cluster Requirements	
Core MS Requirements:	CHE 400: Applied Boundary Value Problems (fall) CHE 441: Advanced Transport Phenomena (fall) CHE 461: Advanced Kinetics and Reactor Design (spring) CHE 485: Thermodynamics and Statistical Mechanics (spring)
Pick One Elective In:	CHE 413: Engineering of Soft Matter CHE 454: Interfacial Engineering CHE 476: Polymer Synthesis and Characterization CHE 487: Surface Analysis
Pick Two Electives In:	CHE 413: Engineering of Soft Matter CHE 420: Biomedical Nanotech CHE 447: Liquid-Crystal Materials and Optical Applications CHE 454: Interfacial Engineering CHE 462: Cell & Tissue Engineering CHE 476: Polymer Synthesis and Characterization CHE 482: Processing Microelectronic Devices CHE 486: Polymer Physics CHE 487: Surface Analysis CHE 489: Biosensors ECE 423: Semiconductor Devices CHM 456: Chemical Bonds-From Molecules to Materials OPT 407: SEM Practicum OPT 421: Optical Properties of Materials PHY 420: Introduction to Condensed Matter Physics
Other electives can be added after consulting with an academic adviser	

Sustainable Energy Cluster

The Sustainable Energy Concentration is for students desiring a solid technical foundation in the fundamental principles of sustainable energy production and utilization. Through the recommended concentration courses, students will acquire an in-depth understanding of the scientific and engineering principles central to various sustainable energy technologies and will develop tools to evaluate their economic feasibilities. Students will also have the opportunity to delve deeper into specific energy technologies in specialized elective courses. The degree can be tailored for students from a broad range of academic majors, including engineering disciplines and the life and physical sciences.

To complete the Sustainable Energy Cluster, students are required to select from the following electives in addition to the MS core classes in thermodynamics, kinetics, transport phenomena and advanced mathematics

Sustainable Energy Cluster Requirements	
Core MS Requirements:	CHE 400: Applied Boundary Value Problems (fall) CHE 441: Advanced Transport Phenomena (fall) CHE 461: Advanced Kinetics and Reactor Design (spring) CHE 485: Thermodynamics and Statistical Mechanics (spring)
Pick One Elective In:	TEC 472: Energy System Economics and Modeling (spring) ERG 488: Introduction to Energy Systems (fall)
Pick Two Electives In:	TEC 472: Energy System Economics and Modeling (spring) ERG 488: Introduction to Energy Systems (fall) EES 436: Physics of Climate (fall) CHE 456: Electrochemical Engineering: Fundamentals and Applications (spring) CHE 458: Electrochemical Engineering: Batteries and Fuel Cells (fall) CHE 460: Solar Cells (fall) CHE 464: Biofuels (fall) CHE 465: Sustainable Chemical Processes (spring) CHM 486: Energy, Science, Technology & Society (spring)
Other electives can be added after consulting with an academic adviser	