



# Chemical Engineering

MASTER OF SCIENCE DEGREE PROGRAM



## A master of science degree from UIC immerses you in the subjects that all chemical engineers need to know.

The program is ideal for students who have completed undergraduate majors in engineering or in chemistry. Even if this represents your first foray into engineering, UIC will ensure that you will attain the knowledge and skills you need for success in the field.

Our MS graduates work in a wide range of industries—a testament to the flexibility and broad applicability of the degree. If you are interested in energy, the environment, materials, biological processes, nanotechnology, or another field, a master's degree in chemical engineering can prepare you for a rewarding career.

### YOU WILL DEVELOP AN ADVANCED UNDERSTANDING OF:

Continuum and Molecular Fluid Mechanics

Heat and Mass Transfer

Macroscopic and Microscopic Thermodynamics

Chemical Kinetics

Process Analysis



## You can complete our master of science program in three ways:

### THESIS OPTION

In conjunction with your coursework, the **thesis option** pairs you with a faculty mentor and gives you the opportunity to write an original research-based thesis on a chemical engineering topic that interests you. Students have found that the specialization of a thesis makes them more marketable to employers. Thesis experience also is ideal for students who might want to continue on for doctoral study after the MS.

### PROJECT OPTION

The **project option** allows you to complete a capstone project with guidance from a faculty advisor, but it does not require a formal presentation or defense. This is a way to delve into a particular application of chemical engineering and showcase your work to potential employers.

### COURSEWORK OPTION

The **coursework-only option** allows you to complete all the credits toward your MS degree through our comprehensive selection of chemical engineering courses.

### International Programs

UIC's international partnership programs allow students from specific universities around the world to complete part of their higher education in our department, potentially culminating in an MS in Chemical Engineering from UIC.

Learn more at [go.uic.edu/COEinternational](http://go.uic.edu/COEinternational).

### A Step Ahead

Thanks to the strength of our curriculum and UIC's global connections, many MS students are able to get **internships** that help them level up their career planning.

### UIC's Academic Strengths

Artificial Photosynthesis

Fuel Innovation

Cancer Detection

Nanotechnology

Complex Fluids

Polymers

Drug Delivery

Water Purification

### Featured Courses

What will you take as an MS student at UIC? Explore your choices at [che.uic.edu](http://che.uic.edu) (see the Courses page under the Graduate menu). Here are a few that have captured our current students' attention—and that have proved especially valuable in their careers after UIC.

#### CHE 425 NANOTECHNOLOGY FOR PHARMACEUTICAL APPLICATIONS

This course explores the emerging role of nanostructures in drug development and delivery. Students discover the principles of nanostructure formation, characterization, surface functionalization, in vitro and in vivo transport, and visualization.

#### CHE 494 GRAPHENE AND 2-D MATERIALS

This course seeks to give students an understanding of advanced two-dimensional nanomaterials, including graphene. It covers the tools required to characterize these atomically thin materials and their potential applications.

#### CHE 494 SOLAR FUEL ENERGY

Solar fuels engineering involves the design and implementation of processes and systems for efficient utilization of solar energy to produce chemicals and fuels, with systems that complete these tasks known as solar fuel generators. This course provides the underlying physics, thermodynamics, and transport characteristics of the components of solar fuel generators.

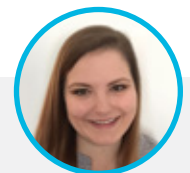


#### Eason Zheng

**Internship:** LanzaTech

**Assignment:** Helping the company's renewable energy and technology departments to design gas-phase reactors for toxic-chemicals removal

**His perspective:** "During the interview process, ask your direct supervisor about career advice. You want to work with someone who's willing to spend time to teach you things and who forgives you when you make mistakes. The internship is a learning process where you will likely make mistakes but learn valuable skills that will carry you a long way."

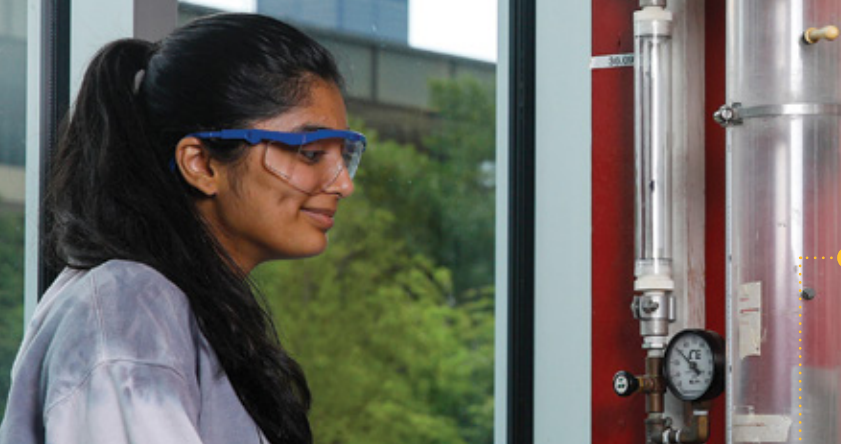


#### Victoria Smith

**Internship:** BorgWarner

**Assignment:** Planning, executing, and presenting the results of a study to evaluate a non-destructive method of quality-testing assembled products. (After completing her internship and the MS program, Victoria accepted a full-time job with Siemens.)

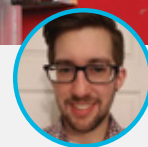
**Her perspective:** "This internship allowed me to get a glimpse into the engineering world. Although you have an idea of what the field will be like before deciding to begin a graduate degree, it was valuable for me to see how engineering day-to-day differed from my experience in the chemistry world."



# After UIC, where to?

Companies that have hired graduates of the UIC MS in Chemical Engineering include:

- 3M
- Actavis Pharmaceutical
- AbbVie**
- Abbott Labs
- Airgas
- Alexander Chemical Corporation
- Alliance India
- Applied Materials
- Argonne National Laboratory
- Baxter Healthcare
- Biogen
- Chobani**
- DSK BioPharma
- Exxon Mobil
- Ford Motor Company
- Fresenius Kabi
- Fujifilm
- Georgia-Pacific
- Hogan Lovells
- Honeywell
- Integrity Energy Group
- Intel
- J.P. Morgan
- McKinsey & Company
- MonoSol
- Motiva Enterprises
- National Chemical Laboratory
- Poly-Carb
- Presence Health
- Quimica Comercial
- Regis Technologies
- Shell
- Siemens
- SunCoke Energy
- Tessenderlo
- UIC Energy Resources Center
- University of Auckland
- VishWamitra Research Institute



**Joseph Kalkowski**  
Associate Scientist, AbbVie

Joseph Kalkowski's work at the pharmaceutical company AbbVie involves examining medicines' active ingredients and dosage forms on a molecular level to understand their properties and how they will interact with their environment. About 70 percent of his time is spent in the lab, and the rest is interacting with people. "I do an unbelievable amount of talking and discussing ideas, issues, and experimental details with colleagues each day," he said.

In his work, Kalkowski finds value in the problem-solving skills and conceptual awareness gained in the MS program at UIC—and in the chemical engineering department's sense of community.

"It's the combination of whom you're around and what their unique interests are that will enable you to grow as an engineer, scientist, or whatever path you choose," he said. "Whether you undertake a research-based MS or go coursework-only, it's the people and what they bring to the department that will tailor the experience and expand your horizons."



**Ragavendra Hari**  
R&D Scientist, Chobani

"UIC was a life-changing experience for me," said Ragavendra Hari. "It was my first time traveling alone, abroad and in a completely different place. It was a nerve-wracking experience. The first semester was difficult to adjust to given the cultural changes and winter, which I had never experienced before coming to the United States."

Testing those waters was worth it. In addition to fun courses that involved debate and discussion as much as experimentation, Hari benefited from an advisor who made his advisees a deal: "I will push you hard, but if you give me your time, I will make sure you have a job you feel content with," Hari recalled. "He kept up that word." Today, Hari helps to create products for the yogurt company Chobani and safeguards its standard of all-natural ingredients.

"Everyone should go to graduate school, especially if your career horizons are R&D," Hari suggested. "Apart from the advanced technical knowledge, grad school teaches you how to be analytical, think differently, and revisit old laws or ideas that you took for granted but did not test personally." These days, he can.

## Admissions

Full details on how to apply—including requirements and deadlines—are at [che.uic.edu](http://che.uic.edu) under the Graduate menu.

Interested in graduate study in chemical engineering at UIC? Talk to us. Contact our graduate team with questions or for an informal conversation.

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