M.Eng. in Chemical Engineering

The Master of Engineering (M.Eng.) degree at Cornell’s Robert Frederick Smith School of Chemical and Biomolecular Engineering enables recent graduates as well as practicing engineers to earn a professional degree while building expertise in several fields of chemical engineering. The diverse personal and academic backgrounds of our faculty and students, and Cornell’s vast facilities, make this an exceptional program in which to pursue both a general program and several areas of specialization which address some of the most demanding challenges of this century:

- **Computer Informatics (CI)** provides unique training at the interface between process engineering and data science (or informatics). It teaches students data analytics skills to derive knowledge and information from process data, as well as decision-support tools for solving real operation problems in the era of big data. The program also offers experience with computational techniques based in the physical sciences such as molecular dynamics and Monte Carlo methods to tame the complexity of modern engineering problems in what we call “physical analytics.” Together these provide some of the most sought after skills in industry today.

- **Energy Economics and Engineering (EEE)** harnesses the breadth of energy-related expertise across the college with a rich modular-based educational program to prepare students for careers in energy related technology, economics, management, and public policy.

- **Medical and Industrial Biotechnology (MIB)** prepares students from engineering and life sciences for careers in biotechnology industries including manufacturing of pharmaceuticals, diagnostics, tissue culture, agricultural products, and new food and energy sources.

- **Product Design (PD)** provides student teams an opportunity to apply chemical engineering and product design principles towards real-world innovative products. The projects at the focus of this course have been developed in collaboration with industrial partners. The student teams prepare a stage-gate feasibility study of a chemical product including market and economic analysis, patent search, environmental, regulatory, and safety issues.

**Intent of the Master of Engineering Program**

This degree is intended to enhance the technical skills of students and to increase their ability to bring value to industry. The curriculum focuses on industrial practice and design, and integrates knowledge across disciplines to prepare students for diverse work environments. Students are encouraged to design a course of study that best suits their professional interests, career goals, and their individual reasons for undertaking the M.Eng. degree. All courses of study require approval by the M.Eng. Director.

*Depiction of Earth Source Heat Phase 2, which includes digging a 3-to-5-kilometer-deep test well safely enclosed in thick concrete and metal piping.*
**Reasons to Pursue the M.Eng. Degree**

- To gain specialized focused knowledge in areas central to chemical engineering
- To deepen knowledge of one topical area related to chemical engineering (computer informatics, energy systems, food science, medical and industrial technology, product design).
- To update knowledge of the latest developments in the field (for practicing engineers)
- To provide necessary skills and knowledge for students with B.S. degrees in other scientific fields who wish to pursue a career in chemical engineering
- To create opportunities for higher compensation and increased supervisory responsibilities for those working in chemical engineering

**Requirements of the M.Eng. Program**

The program requires thirty credit-hours of course work, including a project that allows deeper study of a focus area of the student’s interest. At least twelve of these credits, not including credits earned for the M.Eng. project (more than three credits), must be earned in chemical engineering courses. Elective credits must include electives on Business Practices and Environmental & Societal Impact. Up to two credits may be taken with S/U option. The College of Engineering policy allows students to enroll in up to 22 credits per semester (additional credits require special approval). A course load of 16-18 credits is most common.

- Students with an undergraduate education in chemical engineering typically finish the program in two semesters.
- Students with different training (other engineers, chemists, etc.) may require extra time. Typically, students whose undergraduate degree is NOT ChemE will complete the following undergraduate courses in addition to the courses needed to complete their M.Eng. degree (assuming student has completed calculus and differential equations; otherwise some math refresher courses may also be needed): ENGRD 2190: MASS AND ENERGY BALANCES, CHEME 3230: FLUID MECHANICS, CHEME 3130: CHEMICAL ENGINEERING THERMODYNAMICS, CHEME 3240: HEAT AND MASS TRANSFER, and CHEME 3900: CHEMICAL KINETICS AND REACTOR DESIGN.
- Alternatively, students with a non-ChemE background wishing to reduce time at Cornell to the standard two semesters could consider obtaining some preparatory chemical engineering foundations in a suitable summer program. The department offers an online course for M.Eng. students with a non-ChemE background, CHEME 5200: Fundamentals of Chemical Engineering, right before the fall semester. This online course provides the basic principles of chemical engineering and will inform our decision regarding which undergraduate chemical engineering courses should be taken.

**Placement**

Examples of companies where our graduates have worked after completing the program include (but is not limited to):

- **ARCADIS**
  - Bristol-Myers Squibb*
  - Conoco Phillips
  - Deloitte*
  - General Electric
  - Genentech
  - GTE Products Corporation
  - Intel*
  - Kerry*
  - Merck
  - NOHMs Technologies
  - Regeneron Pharmaceuticals
  - Saudi Aramco
  - Veolia
  - Air Products and Chemicals
  - Codexis
  - Corning
  - ExxonMobil
  - General Mills
  - Global Foundries*
  - IBM*
  - Infinium
  - Kraft Foods
  - Motorola
  - PowerAdvocate
  - Samsung*
  - Schlumberger*
  - Wood Mackenzie

*Indicates employers that have hired international Cornell Engineering MEng students.

For application information visit: [https://www.cheme.cornell.edu/cbe/academics/graduate/meng/](https://www.cheme.cornell.edu/cbe/academics/graduate/meng/)