Chemical engineers are involved in producing all kinds of goods, from plastics, textiles, and fertilizers, to processed foods and antibiotics. Chemical engineers also work in new areas of biotechnology, including designing new methods to fight life-threatening diseases and more effective ways to deliver medications.

They are in demand in many fields, including, in particular, the petroleum, chemical, pharmaceutical, electronics, consumer-products, and food-processing industries. Many find attractive professional opportunities in government agencies, research laboratories, and academic institutions, and a good number rise to positions of considerable technical and managerial responsibility.

Cornell’s undergraduate program in Chemical Engineering offers a coordinated sequence of courses beginning in your sophomore year and extending through your senior year. The fundamental analytic tools of chemical engineering — chemical kinetics, chemical thermodynamics, and fluid mechanics — are developed in the second and third years. In the third year, these tools are used to analyze the units of chemical processes: chemical reactors, bio-reactors, distillation columns, and heat exchangers. In the senior year, students design chemical processes by integrating process units with attention to economics, safety, and environmental impact. Concentrations in biomolecular engineering, polymeric materials, and energy are also available.

If you plan to enter the Chemical Engineering program, be sure to take CHEM 2090: Engineering General Chemistry (or CHEM 2150: Honors General and Inorganic Chemistry, if you have a score of 5 on the CEEB AP Chemistry Exam), and CHEM 2080: General Chemistry II during your first year.

**CHEME Core Required Courses**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGRD 2190</td>
<td>Mass and Energy Balances</td>
</tr>
<tr>
<td>CHEM 2510</td>
<td>Introduction to Experimental Organic Chemistry</td>
</tr>
<tr>
<td>CHEM 2900</td>
<td>Introductory Physical Chemistry Laboratory</td>
</tr>
<tr>
<td>CHEM 3530</td>
<td>Principles of Organic Chemistry</td>
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<td>or</td>
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<tr>
<td>CHEM 3570</td>
<td>Organic Chemistry for the Life Sciences</td>
</tr>
<tr>
<td>CHEM 3890</td>
<td>Honors Physical Chemistry I</td>
</tr>
<tr>
<td>CHEM 3900</td>
<td>Honors Physical Chemistry II</td>
</tr>
<tr>
<td>CHEME 3010</td>
<td>Career Perspectives</td>
</tr>
<tr>
<td>CHEM 3130</td>
<td>Chemical Engineering Thermodynamics</td>
</tr>
<tr>
<td>CHEM 3230</td>
<td>Fluid Mechanics</td>
</tr>
<tr>
<td>CHEM 3240</td>
<td>Heat and Mass Transfer</td>
</tr>
<tr>
<td>CHEME 3320</td>
<td>Analysis of Separation Processes</td>
</tr>
<tr>
<td>CHEME 3720</td>
<td>Introduction to Process Dynamics and Control</td>
</tr>
<tr>
<td>CHEME 3900</td>
<td>Chemical Kinetics and Reactor Design</td>
</tr>
<tr>
<td>CHEME 4320</td>
<td>Chemical Engineering Laboratory</td>
</tr>
<tr>
<td>CHEME 4620</td>
<td>Chemical Process Design</td>
</tr>
</tbody>
</table>

**CHEME By the Numbers**

Starting salaries of B.S. Chemical Engineering graduates (for 2013)

- Low: $41,000
- Median: $70,500
- High: $102,400

ChemE undergraduate students: 266
CBE graduate students: 93
SOME AREAS OF FACULTY RESEARCH

battery power, storage, and transmission
biochemistry and biophysics of biological systems
biological network fragility
biomass conversion
biomedical research and biotechnology
energy harvesting
efficiency of solar cells using photonic crystals
geothermal science
interfacial science
material properties in nanofibers
photonic materials and solar energy capture
polymer rheology
protein conformational studies
soft matter
surface science of organic and inorganic materials
synthetic biology
systems biology
transport in complex fluids

MASTER OF ENGINEERING ChE DEGREE PROGRAM

The one-year Master of Engineering (M.Eng./ChE) degree in CBE will prepare you to hit the ground running and stand out in the career of your choice.

This professional degree gives you the chance to:

• deepen your knowledge in a chosen area (e.g., polymers, food engineering).
• broaden your skills (e.g., take courses in finance, marketing, language proficiency, entrepreneurship, etc.).
• take advantage of one of our sought-after specializations (see next page).
• undertake original research in one of the faculty research programs.

Specializations: We have developed specializations that address the major challenges of the 21st century: human health, sustainable energy, and creating knowledge from chemical data. Roughly two-thirds of our growing cadre of M.Eng. students choose to focus on one of these three specializations:

• Energy Economics and Engineering
• Medical and Industrial Biotechnology
• Materials Informatics

Energy Economics and Engineering is a very popular option with students and employers that trains students to understand the whole energy landscape, from traditional to emerging solutions of energy creation, storage, and transformation. It requires complementary skills in business, environmental concerns, and economics as they relate to energy systems.

Medical and Industrial Biotechnology is a custom-designed option that is guided by our industrial partners. It appeals to those interested in pharmaceutical, biotechnology, and bioengineering industries and prepares our graduates to have critical skills that make them stand out from other applicants.

Materials Informatics is a new option for those who want to complement their undergraduate training in engineering with skills in data mining, “big data” handling, computer simulation, and modeling.

Or... Design your own specialization: One-third of our students prefer to tailor the courses they take to suit their own needs. This might be to prepare for a career in oil and gas industries, or in semiconductor processing, or food science, or many other one-of-a-kind specializations.

Please visit the following website for more details:
http://www.cheme.cornell.edu/cbe/academics/graduate/meng/index.cfm

CHEME ELECTIVE COURSE SAMPLER

CHEME 1120 Introduction to Chemical Engineering
CHEME 2880 Biomolecular Engineering: Fundamentals and Applications
CHEME 4010 Molecular Principles of Biomedical Engineering
CHEME 4020 Cellular Principles of Biomedical Engineering
CHEME 4130 Introduction to Nuclear Science and Engineering
CHEME 4610 Concepts of Chemical Engineering Product Design
CHEME 4630 Practice of Chemical Engineering Product Design
CHEME 4700 Process Control Strategies
CHEME 4810 Biomedical Engineering
CHEME 4840 Microchemical and Microfluidic Systems
CHEME 4900 Undergraduate Projects in Chemical Engineering
CHEME 4990 Senior Seminar
CHEME 5204 Turbomachinery Applications
CHEME 5205 Industrial Applications of Fluid Dynamics
CHEME 5207 Hydrocarbon Resources
CHEME 5208 Renewable Resources from Agriculture
CHEME 5430 Bioprocess Engineering
CHEME 5870 & 5880 Energy Seminar I & II

www.cheme.cornell.edu