

CHEMICAL ENGINEERING

<http://www.rit.edu/kgcoe/chemical>

PROGRAM OVERVIEW FOR EMPLOYERS

Students graduating from the BS program in chemical engineering will have a firm and practical grasp of engineering principles and underlying science associated with traditional applications, and learn to tie together phenomena at the nano-scale with the behavior of systems at the macro-scale. The program includes **five quarters of co-op experience**. Upper-level students can choose three professional technical electives to form a **concentration** in one of five key application domains: biomedical and biochemical systems, alternative energy systems, advanced materials, semiconductor processing or environmental applications. The program culminates in the 5th year with 20 weeks of multidisciplinary design, a **capstone design project** that integrates engineering theory, principles, and processes within a collaborative environment. This capstone experience draws problems presented from corporate partners, allowing students to work on realistic engineering issues.

Degree(s) Awarded

Bachelor of Science

Anticipated Enrollment

Approximately 50 BS students per year

Cooperative Education Component

Undergraduate students are required to complete a total of 50 week co-op work assignments. Students are available for co-op assignments, beginning in their third year of study.

Salary Information (Avg/Range)

Co-op:	\$16.83	\$10.00 - \$26.19
BS:	\$65,675	\$60,000 - \$70,000

Accreditation

Rochester Institute of Technology is fully accredited by the Middle States Association (MSA) of Colleges. The chemical engineering program will seek accreditation by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET) after the first class of students graduates, in accordance with ABET requirements. Accreditation is retroactive to all prior students.

Opening December 2012:

Institute Hall, a new 86,000 sq. ft. facility, new home of the Chemical Engineering Program.

Student Skills & Capabilities

Students will be educated to do the following:

- Analyze traditional chemical engineering unit operations and systems, such as chemical reactors and separators of various configurations.
- Understand underlying principles and measurement techniques associated with the core of a chemical engineering process.
- Design chemical engineering processes incorporating science occurring at the micro- and nano-scale.
- Design chemical engineering processes within specified constraints that involve one or more process units, assembly and disassembly of components.
- Identify, formulate, and solve engineering problems and validate their solutions with self-consistency checks and well-designed experiments.
- Use the techniques, skills, and modern engineering tools necessary for engineering practice. This includes proficiency in MATLAB, EXCEL, LABVIEW, as well as selected process flow chart software.
- Utilize state-of-the-art equipment, from Brookfield viscometers to tri-clover fittings
- Communicate effectively by written, verbal, and graphical means.
- Demonstrate an understanding of the impact of engineering solutions in a global and societal context, the professional and ethical responsibilities associated with the practice of engineering, and contemporary issues facing chemical engineers.

Chemical Engineering

Course Sequence BS degree

First and Second Years:

Chemical Engineering Insights I
Chemical Engineering Insights II
Math Techniques for Chemical Engineering
Chemical Process Analysis
Thermodynamics
Continuum Mechanics I
General & Analytical Chemistry I, II
General Chemistry Lab I, II
Comprehensive Organic Chemistry with Lab
Inorganic Chemistry
Chemical Engineering Principles Lab
University Physics I, and Lab
Calculus I, II
Differential Equations
Multivariable and Vector Calculus
Liberal Arts
Physical Education Activity
First Year Seminar

Third, Fourth and Fifth Years:

(Alternating courses/co-op)
Reaction Engineering
Heat Transfer
Mass Transfer Operations
Chemical Eng. Principles/Processes Lab
Material Science
Continuum Mechanics II
Analytical Tech. for Chemical Engineering
Instrumental Analysis
Math Techniques for Chemical Engineers II
System Dynamics and Control
Microscale Phenomena
Analysis of Multiple Scale Processes
Multidisciplinary Design I, II
Design with Constraint
University Physics II and Lab
Quantum Chemistry
Liberal Arts
Free Electives
Professional Technical Electives

Concentrations (sampling of electives)

Biomedical

Contemporary Issues in Bioengineering
Introduction to Biomaterials
Biomedical Device Engineering
Aerosols in the Respiratory Tract
Biological Physics
Biofilm Engineering

Semiconductor Processing

IC Technology
Thin Film Processes
Microlithography Materials and Processes

Alternate Energy Systems

Renewable Energy Systems
Fuel Cell Technology
Introduction to Hydrogen Technology

Environmental

Contemporary Issues in Energy and the Environment
Environmental Chemistry
Design for the Environment

Advanced Materials

Introduction to Polymer Technology
Materials Processing
Introduction to Biomaterials
Interfacial Phenomena with Applications

Selected Employers for Chemical Engineering Co-op Students:

3M, Anheuser-Busch, Inc., Briggs PLC, Bristol Meyers Squibb, Constellation Energy, Covidien, Danisco Genencor, Dow Chemical, Dupont, First Quality Enterprises, Intel Corporation, King Industries, Logan Aluminum, MOOG Inc., OLED Works, LLC, Orthogonal Inc., Pentair, Rich Products, Robertet, SustainX, Sun Chemical Corporation, The RoviSys Company, Toyota, US Dept of Food & Drug Administration, Vicor Corporation, Xerox, Zotos.

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Office of Cooperative Education and Career Services

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