

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 chemical engineering applications, and will also 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**. Upperclass students 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 real 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 five 10 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:	\$13.09	\$10.00 - \$17.75
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.

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.
- 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.
- 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.
- Participate and function in multi-disciplinary teams.
- 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 (3 quarters)
Math Techniques for Chemical Engineers I
Chemical Process Analysis
Thermodynamics (2 quarters)
Fluid Mechanics (2 quarters)
General Chemistry with Lab (3 quarters)
Organic Chemistry with Lab (2 quarters)
University Physics I, II with Lab (2 quarters)
Calculus (4 quarters)
Differential Equations
Liberal Arts (5 quarters)
Wellness Education
First Year Enrichment (2 quarters)

Third, Fourth and Fifth Years:

(Alternating courses/co-op)
Reaction Engineering (2 quarters)
Heat Transfer
Mass Transfer Operations
Chemical Eng. Principles/Processes Lab (2 quarters)
Material Science
Math Techniques for Chemical Engineers II
System Dynamics and Control
Microscale Phenomena
Analysis of Multiple Scale Processes
Multidisciplinary Design (2 quarters)
Design with Constraint
University Physics III with Lab
Quantum Chemistry
Liberal Arts (4 quarters)
Free Electives (3 quarters)
Professional Technical Electives (3 quarters)

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:

Anheuser-Busch, Inc., Avon, Constellation Energy, Corning, Covidien, Dow Chemical, Evident Technologies, First Quality Enterprises, Intel Corporation, King Industries, Logan Aluminum, MOOG Inc., Orthogonal Inc., Pentair, Rich Products, Sun Chemical Corporation, The RoviSys Company, Thermo-Fisher Scientific, 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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