

CHEMICAL ENGINEERING

Course 10

Department Contact

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Description

Chemical engineers build a bridge between science and manufacturing, applying the principles of chemistry and engineering to solve problems involving the production or use of chemicals. They design equipment and develop processes for large-scale chemical manufacturing, plan and test methods of manufacturing products and treating byproducts, and supervise production. Applications of chemical engineering extend to a variety of specific areas, including energy and the environment, nanotechnology, polymers and colloids, surface science, catalysis and reaction engineering, systems and process design, and biotechnology.

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10	Chemical Engineering
10-B	Chemical-Biological Engineering
10-C	Chemical Engineering with focus in another field
10-ENG	S.B. in Engineering as recommended by the Department of Chemical Engineering

Introductory Classes

- 10.000 **Engineering Molecular Marvels: Careers and ChemE at MIT**
Exposes students to the ways in which chemical technologies have profoundly altered the course of history. Discusses the next century's great challenges, such as curing cancer and supplying the planet's surging demand for clean water, food and energy, sustainably. Provides an overview of how ChemE students apply fundamental engineering principles and leverage technology, from molecules to systems, in the pursuit of practical solutions for these problems and more.
- 10.00 **Molecule Builders**
Project-based introduction to the applications of engineering design at the molecular level. Working in teams, students complete an open-ended design project that focuses on a topic such as reactor or biomolecular engineering, chemical process design, materials and polymers, or energy. Provides students practical exposure to the field of chemical engineering as well as potential opportunities to continue their project designs in national/international competitions.

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10.10 Introduction to Chemical Engineering

Explores the diverse applications of chemical engineering through example problems designed to build computer skills and familiarity with the elements of engineering design. Solutions require application of fundamental concepts of mass and energy conservation to batch and continuous systems involving chemical and biological processes.

Course 10-Friendly UROP Areas

- Broad Institute (BR)
- Koch Institute for Integrative Cancer Research
- Health Sciences and Technology (HST)
- MIT Energy Initiative (EI)

Get Involved with Course 10

- American Institute for Chemical Engineers (AIChE)
- Undergraduate Student Advisory Board (USAB)
- National Organization of Black Chemists and Chemical Engineering (NOBCChE)

Skills

- Knowledge of fundamental engineering principles
- Strong time and project management
- Commercial and business awareness
- Resource management

Possible Future Jobs

- **Chemical engineer:** Design chemical plant equipment and devise processes for manufacturing chemicals and products through applying principles and technology of chemistry, physics, and engineering.
- **Operations and manufacturing engineer:** Design, integrate, or improve manufacturing systems and related processes. Ensure that a plant produces the correct amount of product to the correct specification.
- **Process engineer:** Design, implement, control, and optimize industrial processes – such as chemical, food, pharmaceutical etc.

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Career Industry Examples

Agricultural engineering

Materials science

Petroleum

Biomedical

Nanotechnology

Process engineering

Manufacturing

Nuclear engineering

Sample Employers

Amgen

Chevron

Lockheed Martin

Athenahealth

Clearview Healthcare

Mars & Company

Black Rock Chemicals

Clorox

Oracle

Bloom Energy Corp.

L'Oreal

Pioneer Natural Resources