# CHEMICAL ENGINEERING DEGREE

Students must also complete the Undergraduate Registration Requirement [here](https://catalogs.northwestern.edu/undergraduate/requirements-policies/undergraduate-registration-requirement) and the degree requirements of their home school.

## Course Requirements (48 units)

### Core Courses (32 units)

- 4 mathematics courses [here](https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext)
- 4 engineering analysis and computer proficiency courses [here](https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext)

### 4 units of basic science:

1. PHYSICS 135-2 General Physics
2. PHYSICS 135-3 and General Physics
3. CHEM 131-0 General Chemistry 1
4. CHEM 132-0 and General Chemistry 2
   - or CHEM 151-0 Accelerated General Chemistry 1
   - or CHEM 152-0 Accelerated General Chemistry 2
5. CHEM 171-0 Advanced General Inorganic Chemistry
6. CHEM 172-0 Advanced General Physical Chemistry

### 3 design and communications courses [here](https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext)

### 5 basic engineering courses:

1. CHEM_ENG 210-0 Analysis of Chemical Process Systems
2. CHEM_ENG 211-0 Thermodynamics
3. CHEM_ENG 321-0 Fluid Mechanics
4. MAT_SCI 301-0 Materials Science Principles
5. CHEM_ENG 312-0 Probability and Statistics for Chemical Engineering
   - or IEMS 303-0 Statistics

### 7 social sciences/humanities courses [here](https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext)

### 5 unrestricted electives [here](https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext)

## Major Program (16 units)

### 11 Required Courses:

1. CHEM 210-1 Organic Chemistry
2. CHEM 210-2 and Organic Chemistry
3. CHEM_ENG 212-0 Phase Equilibrium and Staged Separations
4. CHEM_ENG 275-0 Molecular & Cell Biology for Engineers
5. CHEM_ENG 307-0 Kinetics and Reactor Engineering
6. CHEM_ENG 322-0 Heat Transfer
7. CHEM_ENG 323-0 Mass Transfer
8. CHEM_ENG 341-0 Dynamics and Control of Chemical and Biological Processes
9. CHEM_ENG 342-0 Chemical Engineering Laboratory
10. CHEM_ENG 351-0 Process Economics, Design, & Evaluation
11. CHEM_ENG 352-0 Chemical Engineering Design Projects

## Technical Electives:

- 2 advanced chemical engineering courses from an approved list available from the department
- 1 engineering course from an approved list available from the department or 1 unit of independent study

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1. See general requirements [here](https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext) for details.
2. PHYSICS 140-2 Fundamentals of Physics may be substituted for PHYSICS 135-2 General Physics. PHYSICS 140-3 Fundamentals of Physics may be substituted for PHYSICS 135-3 General Physics. Associated labs are PHYSICS 136-2 General Physics Laboratory and PHYSICS 136-3 General Physics Laboratory.
3. BIOL_SCI 215-0 Genetics and Molecular Biology or BIOL_SCI 219-0 Cell Biology may substitute for CHEM_ENG 275-0 Molecular & Cell Biology for Engineers.