

CHEMICAL ENGINEERING DEGREE

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

Requirements (48 units)

Core Courses (27 units)¹

Course **Title**
4 mathematics courses (<https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext>)

4 units of basic science:²

| | |
|-------------------------------|--|
| PHYSICS 135-2 | General Physics |
| CHEM 131-0 & CHEM 132-0 | Fundamentals of Chemistry I and Fundamentals of Chemistry II |
| or CHEM 151-0 & CHEM 152-0 | General Chemistry I and General Chemistry II |
| or CHEM 171-0 & CHEM 172-0 | Advanced General Inorganic Chemistry and Advanced General Physical Chemistry |
| CHEM_ENG 275-0 | Molecular & Cell Biology for Engineers ³ |
| or BIOL_SCI 201-0 | Molecular Biology |
| or BIOL_SCI 202-0 | Cell Biology |

4 engineering analysis and computer proficiency courses (<https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext>)

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

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

5 unrestricted electives (<https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext>)

Major Program (21 units)

| Course | Title |
|---------------------------------|--|
| 16 required courses | |
| CHEM 215-1 & CHEM 215-2 | Organic Chemistry I and Organic Chemistry II |
| MAT_SCI 301-0 | Introduction to Materials Science and Engineering Principles |
| COMP_SCI 150-0 | Fundamentals of Computer Programming 1.5 |
| CHEM_ENG 210-0 | Analysis of Chemical Process Systems |
| CHEM_ENG 211-0 | Thermodynamics |
| CHEM_ENG 212-0 | Phase Equilibrium and Staged Separations |
| CHEM_ENG 307-0 | Kinetics and Reactor Engineering |
| CHEM_ENG 312-0 or IEMS 303-0 | Probability and Statistics for Chemical Engineering Statistics |
| CHEM_ENG 321-0 | Fluid Mechanics |
| CHEM_ENG 322-0 | Heat Transfer |
| CHEM_ENG 323-0 | Mass Transfer |
| CHEM_ENG 341-0 | Dynamics and Control of Chemical and Biological Processes |
| CHEM_ENG 342-0 | Chemical Engineering Laboratory |
| CHEM_ENG 351-0 | Process Economics, Design, & Evaluation |
| CHEM_ENG 352-0 | Chemical Engineering Design Projects |

5 technical elective courses

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

1 advanced science or mathematics course from an approved list available from the department

1 engineering, advanced science, or mathematics course from an approved list available from the department

¹ See general requirements (<https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext>) for details.

² PHYSICS 125-2 General Physics for ISP or PHYSICS 140-2 Fundamentals of Physics may be substituted for PHYSICS 135-2 General Physics. Concurrent registration with the associated labs (PHYSICS 136-2 General Physics Laboratory or PHYSICS 126-2 Physics Laboratory for ISP) is required. PHYSICS 135-3 General Physics is a required basic science course for students entering before Fall 2023 and is part of the approved technical elective list for students entering after Fall 2023 and who are using the current catalog. PHYSICS 135-3 General Physics may also be substituted by PHYSICS 125-3 General Physics for ISP or PHYSICS 140-3 Fundamentals of Physics.

³ BIOL_SCI 201-0 Molecular Biology or BIOL_SCI 202-0 Cell Biology may be substituted for CHEM_ENG 275-0 Molecular & Cell Biology for Engineers. Exemptions from this one unit of biology coursework are NOT granted for students placing out of BIOL_SCI 201-0 Molecular Biology through the Biological Sciences Department's placement test. These students may use CHEM_ENG 275-0 Molecular & Cell Biology for Engineers or BIOL_SCI 202-0 Cell Biology to complete the required biology unit.