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.

<table>
<thead>
<tr>
<th>Course Requirements (48 units)</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Courses (32 units)</td>
<td></td>
</tr>
<tr>
<td>4 mathematics courses</td>
<td></td>
</tr>
<tr>
<td>4 engineering analysis and computer proficiency courses</td>
<td></td>
</tr>
<tr>
<td>4 units of basic science:</td>
<td></td>
</tr>
<tr>
<td>PHYSICS 135-2</td>
<td>General Physics</td>
</tr>
<tr>
<td>&amp; PHYSICS 135-3</td>
<td>and General Physics</td>
</tr>
<tr>
<td>CHEM 131-0</td>
<td>General Chemistry 1</td>
</tr>
<tr>
<td>&amp; CHEM 132-0</td>
<td>and General Chemistry 2</td>
</tr>
<tr>
<td>or CHEM 151-0</td>
<td>Accelerated General Chemistry 1</td>
</tr>
<tr>
<td>&amp; CHEM 152-0</td>
<td>and Accelerated General Chemistry 2</td>
</tr>
<tr>
<td>or CHEM 171-0</td>
<td>Advanced General Inorganic Chemistry</td>
</tr>
<tr>
<td>&amp; CHEM 172-0</td>
<td>and Advanced General Physical Chemistry</td>
</tr>
</tbody>
</table>

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

5 basic engineering courses:

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

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 (16 units)

11 Required Courses:

- CHEM 215-1 Organic Chemistry I
  & CHEM 215-2 and Organic Chemistry II
- CHEM_ENG 212-0 Phase Equilibrium and Staged Separations
- CHEM_ENG 275-0 Molecular & Cell Biology for Engineers
- CHEM_ENG 307-0 Kinetics and Reactor Engineering
- 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 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

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. PHYSICS 125-3 General Physics for ISP or PHYSICS 140-3 Fundamentals of Physics may be substituted for PHYSICS 135-3 General Physics. Associated labs are PHYSICS 126-2 Physics for ISP Laboratory or PHYSICS 136-2 General Physics Laboratory and PHYSICS 126-3 Physics for ISP Laboratory or PHYSICS 136-3 General Physics Laboratory.

3 BIOL_SCI 201-0 Molecular Biology or BIOL_SCI 202-0 Cell Biology may substitute for CHEM_ENG 275-0 Molecular & Cell Biology for Engineers. Exemptions from this one unit of biology coursework are NOT granted for students testing out of and skipping 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.