What can I do with a major in...

Chemical engineering

ACTIVITIES CHEMICAL ENGINEERING MAJORS DO:
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. Chemical engineers also work in a variety of manufacturing industries other than chemical manufacturing, such as those producing electronics, photographic equipment, clothing, and pulp and paper. They also work in the healthcare, biotechnology, and business services industries.

Chemical engineers apply principles of chemistry, physics, mathematics, and mechanical and electrical engineering. They frequently specialize in a particular chemical process such as oxidation or polymerization. Others specialize in a particular field, such as materials science, or in the development of specific products such as fertilizers and pesticides, automotive plastics, or chlorine bleach. They must be aware of all aspects of chemical manufacturing and how it affects the environment, the safety of workers, and the customers. Chemical engineers use computer technology to optimize all phases of research and production, so they need to understand how to apply computer skills to chemical process analysis, automated control systems, and statistical quality control.

INDUSTRIES CHEMICAL ENGINEERING MAJORS WORK IN (SAMPLE LISTING):

<table>
<thead>
<tr>
<th>Pharmaceuticals</th>
<th>Manufacturing</th>
<th>Petroleum</th>
<th>Higher education</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consulting</td>
<td>Polymer resins</td>
<td>Healthcare</td>
<td>Tire and rubber</td>
</tr>
<tr>
<td>Biotechnology</td>
<td>Pulp and paper</td>
<td>Clothing/textiles</td>
<td>Industrial products</td>
</tr>
<tr>
<td>Parts design</td>
<td>Food/beverage</td>
<td>Pest control</td>
<td>Packaging</td>
</tr>
<tr>
<td>Mining</td>
<td>Appliance manufacturing</td>
<td>Agriculture</td>
<td>Pharmaceutical products</td>
</tr>
</tbody>
</table>

EMPLOYERS WHO HIRE CHEMICAL ENGINEERING MAJORS (SAMPLE LISTING):

<table>
<thead>
<tr>
<th>3M</th>
<th>Applied Materials</th>
<th>Ecolab</th>
<th>FM Global</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accenture</td>
<td>Andersen Corporation</td>
<td>Aveda</td>
<td>Schlumberger</td>
</tr>
<tr>
<td>Brady Corporation</td>
<td>BASF</td>
<td>Flint Hills Resources</td>
<td>Nova-Tech Engineering</td>
</tr>
<tr>
<td>ExxonMobil</td>
<td>Emerson Process Management</td>
<td>Honeywell</td>
<td>MOM Brands</td>
</tr>
<tr>
<td>Land O’Lakes Inc.</td>
<td>The Dow Chemical Company</td>
<td>General Mills</td>
<td>Boston Scientific</td>
</tr>
<tr>
<td>Phillips 66</td>
<td>Arkema</td>
<td>Bemis Company</td>
<td>Cargill</td>
</tr>
</tbody>
</table>

TYPES OF POSITIONS FOR CHEMICAL ENGINEERING MAJORS (SAMPLE LISTING):

- **Project engineer:** Organizes and runs projects for engineering companies. This can be anything from managing a small modification to an existing pharmaceutical facility to building a multi-billion dollar petrochemicals complex.
- **Design engineer:** Responsible for determining how a process will work. For example, they decide which pieces of equipment will be needed and how big they will be.
- **Operations engineer:** Works “on site,” spending time ensuring that a plant is producing the right amount of product to the correct specification.
- **Research and development engineer:** Develops the ideas for future plants, improving efficiency, environmental performance, and even developing new products.
- **Product engineer:** Follows the production cycle of a particular product to ensure it is meeting specification. Product engineers may work with marketing and R&D to ensure that a product will meet the needs of customers, then sees the product through production. They may work on new products or variations of existing products.
TYPES OF POSITIONS FOR CHEMICAL ENGINEERING MAJORS (Continued):

- **Quality control engineer:** Monitors the manufacturing of products to ensure that quality standards are maintained. Quality control engineers may bring samples of a product in from a field test or from a normal application, and then test them to determine how specific properties — such as strength, color, and weatherability — change over time.

- **Sales and marketing engineer:** Assists customers in solving production and process problems by providing products and services to meet their specific needs. Chemical engineers in sales use their technical knowledge to sell chemicals, equipment, and other products, and provide follow-up services and training where needed.

**Some of these positions may require an advanced degree.**

USEFUL WEBSITES FOR CHEMICAL ENGINEERING MAJORS:

- Department of Chemical Engineering and Materials Science: [cems.umn.edu](http://cems.umn.edu)
- Chemical Engineering Jobs: [chemicalengineer.com](http://chemicalengineer.com)
- Chemistry Jobs: [chemistryjobs.com](http://chemistryjobs.com)
- Why Not Chemical Engineering: [whynotchemeng.com](http://whynotchemeng.com)

USEFUL WEBSITES FOR ENGINEERING MAJORS:

- Engineer.net: [engineer.net](http://engineer.net)
- Engineer Jobs: [engineerjobs.com](http://engineerjobs.com)
- Engineering Central: [engcen.com](http://engcen.com)
- Graduating Engineer: [graduatingengineer.com](http://graduatingengineer.com)
- ThinkJobs.com: [thinkjobs.com](http://thinkjobs.com)
- Engineering.com: [engineering.com](http://engineering.com)

PROFESSIONAL ORGANIZATIONS:

- American Chemical Society: [acs.org](http://acs.org)
- American Institute of Chemical Engineers: [aiche.org](http://aiche.org)
- American Petroleum Institute: [api.org](http://api.org)
- Society of Petroleum Engineers: [spe.org](http://spe.org)
- Society of Plastics Engineers: [4spe.org](http://4spe.org)
- American Council of Engineering Companies: [aec.org](http://aec.org)
- American Council of Engineering Companies-MN chapter: [acecmn.org](http://acecmn.org)
- National Society of Professional Engineers: [nspe.org](http://nspe.org)
- Minnesota Society of Professional Engineers: [mnspe.org](http://mnspe.org)
- Society of Women Engineers: [swe.org](http://swe.org)

*Additional job/internship search websites and resources can be found at cse.umn.edu/career.*

Information on this page was compiled from the Occupational Outlook Handbook, SloanCareerCornerstone.org, WhyNotChemEng.com, the Encyclopedia of Careers and Vocational Guidance, University of Minnesota departmental websites, and student-reported data.