MANUFACTURING AND DESIGN 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><strong>Core Courses (32 units)</strong></td>
<td></td>
</tr>
<tr>
<td>4 mathematics courses (<a href="https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext">https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext</a>)</td>
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<tr>
<td>4 engineering analysis and computer proficiency courses (<a href="https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext">https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext</a>)</td>
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<tr>
<td>4 units of basic science: 2</td>
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<tr>
<td>PHYSICS 135-2 &amp; PHYSICS 135-3 &amp; PHYSICS 136-2 &amp; PHYSICS 136-3</td>
<td>General Physics and General Physics Laboratory and General Physics Laboratory</td>
</tr>
<tr>
<td>CHEM 131-0 &amp; CHEM 141-0 or CHEM 151-0 &amp; CHEM 161-0 or CHEM 171-0 &amp; CHEM 181-0</td>
<td>General Chemistry 1 and General Chemistry Laboratory 1 and Accelerated General Chemistry I and Accelerated General Chemistry Laboratory 1 and Advanced General Inorganic Chemistry and Advanced General Inorganic Chemistry Laboratory</td>
</tr>
<tr>
<td>3 design and communications courses (<a href="https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext">https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext</a>)</td>
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<tr>
<td>5 basic engineering courses:</td>
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<tr>
<td>MECH_ENG 233-0</td>
<td>Electronics Design</td>
</tr>
<tr>
<td>CIV_ENV 216-0</td>
<td>Mechanics of Materials I</td>
</tr>
<tr>
<td>MAT_SCI 201-0</td>
<td>Introduction to Materials</td>
</tr>
<tr>
<td>CIV_ENV 205-0</td>
<td>Economics and Finance for Engineers</td>
</tr>
<tr>
<td>1 additional course from any McCormick basic engineering category except Probability, Statistics &amp; Quality Control (<a href="https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext">https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext</a>)</td>
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</tr>
<tr>
<td>7 social sciences/humanities courses (<a href="https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext">https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext</a>)</td>
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</tr>
<tr>
<td>5 unrestricted electives (<a href="https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext">https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext</a>)</td>
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<tr>
<td><strong>Major Program (16 units)</strong></td>
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<tr>
<td>9 core courses:</td>
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</tr>
<tr>
<td>DSGN 308-0 or MECH_ENG 315-0</td>
<td>Human-Centered Product Design or Theory of Machines: Design of Elements</td>
</tr>
<tr>
<td>IEMS 201-0</td>
<td>Introduction to Statistics 3</td>
</tr>
<tr>
<td>IEMS 307-0</td>
<td>Quality Improvement by Experimental Design</td>
</tr>
<tr>
<td>IEMS 310-0</td>
<td>Operations Research</td>
</tr>
<tr>
<td>IEMS 382-0</td>
<td>Operations Engineering and Management</td>
</tr>
<tr>
<td>MAT_SCI 318-0</td>
<td>Materials Selection</td>
</tr>
<tr>
<td>MECH_ENG 240-0</td>
<td>Intro to Mechanical Design and Manufacturing</td>
</tr>
<tr>
<td>MECH_ENG 340-1</td>
<td>Computer Integrated Manufacturing: Manufacturing Processes</td>
</tr>
<tr>
<td>MECH_ENG 340-2 or MECH_ENG 340-3</td>
<td>Computer Integrated Manufacturing: CAD/CAM or Computer Integrated Manufacturing: Automation</td>
</tr>
</tbody>
</table>

3 project courses:

- DSGN 384-1 & DSGN 384-2 Interdisciplinary Product Design Projects I & II
- DSGN 386-0 Manufacturing Engineering Design (must be taken in the final spring quarter before graduation)

4 technical electives:

- 2 200-level or 300-level engineering courses.
- 2 300-level engineering courses.

Courses numbered 395 will need a petition.

Students may only count up to two 399 course towards their tech electives.

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 140-3 Fundamentals of Physics may be substituted for PHYSICS 135-2 General Physics.

3 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 IEMS 303-0 Statistics may be substituted if an additional math course, such as IEMS 202-0 Probability, is also taken.