## Mechanical Engineering

### Freshman Year

<table>
<thead>
<tr>
<th>Fall Semester</th>
<th>Spring Semester</th>
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</thead>
<tbody>
<tr>
<td>Math 1371 Calculus I (placement into course, or pre-req)</td>
<td>Math 1372 Calculus II (1371)</td>
</tr>
<tr>
<td>Phys 1301W Intro Physics I (&amp;Math 1371)</td>
<td>Phys 1302W Intro Physics II (1301, &amp;Math 1372)</td>
</tr>
<tr>
<td>Liberal Education course (Biology recommended)</td>
<td>Chem 1061/65 Chem Princ I (placement into course, or 1015)</td>
</tr>
<tr>
<td>Lib Ed or Writ 1301/1401</td>
<td>Lib Ed or Writ 1301/1401</td>
</tr>
<tr>
<td>CSE 1001: 1st Yr Experience</td>
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### Sophomore Year

<table>
<thead>
<tr>
<th>Fall Semester</th>
<th>Spring Semester</th>
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<tbody>
<tr>
<td>Math 2374 Multiv. Calculus (1372)</td>
<td>Math 2373 Lin Alg/Diff Eq. (1372)</td>
</tr>
<tr>
<td>AEM 2021 Statics &amp; Dynamics (Phys 1301, &amp;Math 2374)</td>
<td>CSci 1113 Intro to C/C++ (Math 1371)</td>
</tr>
<tr>
<td>MatS 2001 Intro to Engrg Math (Chem 1061/65, Math 1372, Phys 1301, 4)</td>
<td>AEM 3031 Deform Body Mech (2021, Math 2374, &amp;Math 2373)</td>
</tr>
<tr>
<td>MatS 2002 Lab (ME Majors only) (&amp;MatS 2001)</td>
<td>ME 3331 Thermal Sciences I (Chem 1061/65, Phys 1301)</td>
</tr>
<tr>
<td>ME 2011 Intro Engineering (CSE pre-major)</td>
<td>Liberal Education course</td>
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### Junior Year

<table>
<thead>
<tr>
<th>Fall Semester</th>
<th>Spring Semester</th>
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<tbody>
<tr>
<td>ME 3221 Design &amp; Manuf I (UD, 2011, AEM 3031, MatS 2001)</td>
<td>ME 3222 Design &amp; Manuf II (UD, &amp;3221, CSci 1113)</td>
</tr>
<tr>
<td>ME 3332 Thermal Sci II (UD, 3331, Math 2373)</td>
<td>ME 3333 Thermal Sci III (UD, 3332)</td>
</tr>
<tr>
<td>IE 3521 Stats, Qual, Relia (Math 1372)</td>
<td>ME 3281 Sys Dyn &amp; Control (AEM, UD, 2021, Math 2373)</td>
</tr>
<tr>
<td>EE 3005 Fund of EE (Phys 1302, Math 2373)</td>
<td>ME 4031W Basic Measure Lab (UD ME, 3331, IE 3521)</td>
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<td>EE 3006 Fund of EE Lab (&amp;3005)</td>
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### Senior Year

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<thead>
<tr>
<th>Fall Semester</th>
<th>Spring Semester</th>
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<tbody>
<tr>
<td>Technical Elective I</td>
<td>Technical Elective I</td>
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<tr>
<td>Technical Elective II</td>
<td>Technical Elective III</td>
</tr>
<tr>
<td>ME 4x3x Senior Lab (ME 4031W)</td>
<td>Technical Elective IV</td>
</tr>
<tr>
<td>Liberal Education course</td>
<td>Liberal Education course</td>
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### About This Plan
- This plan is not a contract. Curriculum can change.
- Shaded courses are only offered in the indicated semester.
- Course pre-requisites and co-requisites (designated by &) are listed below the course number and title. UD requires admission to the major prior to enrollment.
- Students can take either the CSE-only or University-wide versions of the math course (Math 1371/1271, 1372/1272, 2373/2243, 2374/2263).
- Double boxed courses, along with one of two courses with a dashed outline, are required for application to this major.
- Bio/Lab must be taken A-F to fulfill Natural Science requirement.
- Chemical Principles lab (1065) must be taken concurrently with the lecture (1061).
- Liberal Education and Writing requirements with an (*) will be fulfilled by taking courses required for this major at UM-TC.

### Applying to your Major
Students who have completed the required courses for admission to this major and have a 3.2 UM-TC technical GPA at the end of the fall semester will be guaranteed admission. All other students who have completed the required courses will be considered for admission on a space-available basis. Admission following the spring semester is only based on space availability. The major application database is available at z.umn.edu/csemajorapp.

### University Degree Requirements
- **Total Credits Needed for Degree:** 125

### Department Contact Information
- **Website:** www.me.umn.edu
- **Main Phone:** 612-625-5842
- **Main Office:** 1100 ME
- **Director of Undergraduate Studies:** Professor Tom Chase
- **Department Email:** Jeanne Sitzmann sitzm001@umn.edu

### Writing Requirements:
- **University Writing:** Writ 1301/1401 or equivalent
- **Writing Intensive (WI):**
  - Two: 1xxx or 2xxx level **
  - One: 3/4/5xxx level (in major)*
  - One: 3/4/5xxx level (any dept)*

### Liberal Education

<table>
<thead>
<tr>
<th>CORES:</th>
<th>THEMES:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bio</td>
<td>Civ</td>
</tr>
<tr>
<td>Phy*</td>
<td>DSJ</td>
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<tr>
<td>His</td>
<td>Env</td>
</tr>
<tr>
<td>SocS</td>
<td>GP</td>
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<tr>
<td>Lit</td>
<td>TP</td>
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<tr>
<td>AH</td>
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<tr>
<td>Mth*</td>
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</table>

*Liberal Education requirements, as noted on their APAS report.
What can I do with a major in mechanical engineering?

Mechanical engineers design and develop power-producing machines, such as internal combustion engines, steam and gas turbines, and jet and rocket engines. They use computers to form preliminary designs for systems or devices, perform calculations that will predict the behavior of the design, and collect and analyze performance data. Mechanical engineers also design and develop power-using machines, such as refrigeration and air-conditioning equipment, robots, machine tools, material handling systems, and industrial production equipment. Mechanical engineers design tools needed by other engineers to do their work. They combine practical and technical skills with analytical and intellectual pursuits. In addition, mechanical engineers may work in production operations in manufacturing, agriculture, maintenance, or technical sales and many are administrators or managers. Mechanical engineering is one of the broadest engineering disciplines. Mechanics, energy, heat, mathematics, engineering sciences, design, and manufacturing are the foundation of mechanical engineering.

Mechanical engineers can specialize in applied mechanics, design engineering, heat transfer, power plant engineering, nanofabrication, pressure vessels and piping, plant maintenance, biomedical engineering, construction, and underwater technology.

**Employers (sample listing)**

3M  
Applied Materials  
Eaton Corporation  
Medtronic, Inc.  
Oak River Technology  
Brady Corporation  
IBM  
Cargill  
Datadard Group  

Parker Hannifin  
Donaldson Company  
Ecolab  
Graco Inc.  
Rockwell Automation  
Boston Scientific  
Accenture  
Cummins Inc.  
ExxonMobil  
Honeywell  
Ingersoll Rand  
Beckman Coulter  
DuPont  
Flint Hills Resources  
Micron Technology  
General Electric  
General Dynamics  
Polar Semiconductor Inc.

**Industries (sample listing)**

Manufacturing  
Measurement systems  
Automotive  
Petroleum  
Heating and cooling  

Government agencies  
Packaging  
Technical sales  
Alternative energy  
Pumps and fluid systems  
Telecommunications  
Biomedical  
Computer technologies  
Environmental  
Consulting  
Research and development

**Positions (sample listing)**

**Design Engineer:** Develops mechanical automation designs from customer specifications, conducts design reviews with customers, uses analytical tools to assist in the design process, and interfaces with suppliers.

**Energy Engineer:** Works with architects, engineers, contractors, and stakeholders to provide sustainable design services to the commercial building sector by identifying opportunities for energy savings and reduction.

**Drilling Engineer:** Plans and designs oil and gas wells in support of a drilling organization with an emphasis on safety, cost, and efficiency improvement.

**Quality Engineer:** Supports development and ensures compliance with a company’s quality management system (QMS) in accordance with industry standards, and provides technical support to product engineering, marketing, and manufacturing.

*Some positions may require an advanced degree.*

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**Career Center**  
cse.umn.edu/career  

**Salary Information**  
z.umn.edu/csesalary  

**More Information on Undergraduate Majors**  
cse.umn.edu/majors