Engineering Technology: Mechanical & Manufacturing Systems Option

Bachelor of Science (BS)

Engineering technology emphasizes the application of scientific and engineering techniques to a variety of real-world problems. Application is the key word in this definition, in that engineering technology emphasizes practical applications as well as theory. Engineering technologists work in the job spectrum between the engineer and the skilled technician, with responsibilities closest to those of the engineer.

The Mechanical & Manufacturing Systems option emphasizes building strong proficiencies in design, development, application and management of product, manufacturing processes and systems. A broad core of technical course work is presented in detail, from conventional machining operations to the latest applications and principles of computer-aided design using CAD/CAM, advanced manufacturing processes, robotics, integrated automation systems, quality control and improvement systems, along with advanced techniques in solid-modeling and prototype production. The introduction and application of manufacturing trends and innovations are reinforced throughout the program by integrated laboratory experiences.

**Becoming Career Ready...**

- Faculty with relevant industry experience work closely with students by providing them with career-ready practical experience and a technology-based curriculum in the state-of-the-art Otto & Della Seabaugh Polytechnic building.

- Engineering technologists graduates work in the job spectrum between the engineer and the skilled technician with responsibilities closest to those of the engineer. Examples of job titles include manufacturing engineer, quality control engineer, manufacturing supervisor, design engineer, maintenance engineer and production manager.

- 100% of Southeast programs offer real-world experience. Mechanical & Manufacturing students earn this experience through a senior design capstone course for students to work in teams to solve open-ended industrial projects. Students also gain valuable hands-on experience through required labs that accompany the courses work.

- The path to a successful career starts with you! You can maximize your career development by working closely with Career Services and Southeast faculty – they are here to help you connect your passions, interests, and skills to jobs and opportunities in the field. Career Services provides professional career counseling and coaching, resume critiques, practice interviews, job search strategies, career events, networking opportunities and more.

**Career Opportunities:**

- Production manager
- Manufacturing engineer
- Engineering technician
- Quality engineer
- Product/process engineer
- Industrial engineer
- Plant engineer
- Engineering applications analyst

**Equipment and Computer Programs**

We have developed laboratories to provide our students with an opportunity to master a working knowledge of engineering technology. Mechanical & Manufacturing students will:

- Learn to design products, systems, components, or processes with good structure, function, quality and manufacturing ability.
- Learn to work with engineers in the design phase of product and process development.
- Use real-world laboratory equipment and industrial projects.
- Utilize course work with a balance of theoretical and practical applications in quality control, machine design, manufacturing processes, fluid power, robotics, automation, computer integrated manufacturing and safety.

**Options with Engineering Technology**

Students who choose the mechanical and manufacturing systems option are required to take the Society of Manufacturing Engineers (SME) certification, Certified Manufacturing Technologist (CMfgT). Certification through SME’s Manufacturing Engineering Certification Institute (MECI/SME) is a program of professional documentation and recognition of an individual’s manufacturing-related knowledge, skills, and capabilities. By becoming certified, you join an elite group of manufacturing professionals who have documented their manufacturing skills and knowledge.

Other certifications available after graduation and relevant work experience include:

- Certified Manufacturing Engineer (CMfgE)
- Certified Enterprise Integrator (CEI)
- Certified Engineering Manager (CEM)

For more information, visit [www.sme.org](http://www.sme.org).

**Transfer and Dual Credit Students**

If you have dual credit or transfer credit, please visit our transfer course equivalencies guide at semo.edu/transfercredit.
This is a guide based on the 2020-2021 Undergraduate Bulletin and is subject to change. The time it takes to earn a degree will vary based on several factors such as dual enrollment, remediation, and summer enrollment. Students will meet with an academic advisor each semester and use Degree Works to monitor their individual progress.

**CURRICULUM CHECKLIST**

**Engineering Technology: Mechanical & Manufacturing Option** – 100 hours
- CH181 Basic Principles of Chemistry (5)
- ET304 Introduction to PLCs (3)
- IM300 Technical Communications (3)
- IM301 Industrial Safety Supervision (3)
- IM311 Statistical Process Control (3)
- MA137 Precalculus (5)
- MA140 Analytic Geometry & Calculus I (5)
- MA144 Integral Calculus & Differential Equations (5)
- MN 220 Engineering Economic Analysis (3)
- MN 260 Technical Computer Programming Applications (3)
- MN 356 Robotic Fundamentals (3)
- MN 383 Fluid Power (3)
- MN 412 Advanced Manufacturing Systems (3)
- MN 356 Robotic Fundamentals (3)
- MN 350 Machine Design (3)
- MN 324 Mechanical Design Processes (3)
- MN 324 Machine Design Processes (3)
- MN 319 Statics and Strengths of Materials (3)
- MN 410 Manufacturing Research (3)
- ET160 Basic Electricity and Electronics (3)
- UI 410 Manufacturing Research (3)
- UI319 Science, Technology, & Society (3)
- SW207 Understanding Cultural & Social Diversity (3)
- UI319 Science, Technology, & Society (3)
- UI 410 Manufacturing Research (3)
- EN100 3  IM300 3
- EN100 3  MA140 5
- CH181/081/001 5  MN170 3
- MA137 5  PH120/020 5
- Total 16  Total 16

**MECHANICAL & MANUFACTURING OPTION**
- MN120 Fundamentals of Engineering Design Processes (3)
- MN203 Industrial Materials and Processes I (3)
- MN211 Solid Modeling & Rapid Prototyping (3)
- MN304 Industrial Materials & Processes II (3)
- MN319 Statics and Strengths of Materials (3)
- MN324 Mechanical Design Processes (3)
- MN350 Machine Design (3)
- MN354 Computer Aided Manufacturing (CAM) (3)
- MN402 Plastics & Processes (3)
- MN416 Manufacturing Seminar (1)

**General Education Requirements** – some requirements may be fulfilled by coursework in major program
- Social and Behavioral Sciences – 6 hours
- Constitution Requirement – 3 hours
- Written Communication – 6 hours
- Oral Communication – 3 hours
- Natural Sciences – 7 hours (from two disciplines, one to include a lab)
- Mathematics – 3 hours
- Humanities & Fine Arts – 9 hours (from at least two disciplines)
- Additional requirements – 5 hours (to include UI100 for native students)
- Civics examination

*Many major courses are on a set rotation and dependent on when prerequisites are completed. The actual semester a course is taken may vary based on the rotation.

**SAMPLE FOUR-YEAR PLAN**

<table>
<thead>
<tr>
<th>Course #</th>
<th>Fall Semester</th>
<th>Hrs</th>
<th>Spring Semester</th>
<th>Hrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>UI100</td>
<td>3</td>
<td></td>
<td>IM300</td>
<td>3</td>
</tr>
<tr>
<td>EN100</td>
<td>3</td>
<td></td>
<td>MA140</td>
<td>5</td>
</tr>
<tr>
<td>CH181/081/001</td>
<td>5</td>
<td>MN170</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>MA137</td>
<td>5</td>
<td></td>
<td>PH120/020</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>16</td>
<td></td>
<td>Total</td>
<td>16</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course #</th>
<th>Fall Semester</th>
<th>Hrs</th>
<th>Spring Semester</th>
<th>Hrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>ET160</td>
<td>3</td>
<td></td>
<td>IM301</td>
<td>3</td>
</tr>
<tr>
<td>MA144</td>
<td>5</td>
<td></td>
<td>MN221</td>
<td>3</td>
</tr>
<tr>
<td>MN203</td>
<td>3</td>
<td></td>
<td>MN260</td>
<td>3</td>
</tr>
<tr>
<td>MN120</td>
<td>3</td>
<td></td>
<td>MN319</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>16</td>
<td></td>
<td>Total</td>
<td>15</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course #</th>
<th>Fall Semester</th>
<th>Hrs</th>
<th>Spring Semester</th>
<th>Hrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>IM311</td>
<td>3</td>
<td></td>
<td>ET304</td>
<td>3</td>
</tr>
<tr>
<td>MN203</td>
<td>3</td>
<td></td>
<td>MN220</td>
<td>3</td>
</tr>
<tr>
<td>MN324</td>
<td>3</td>
<td></td>
<td>MN304</td>
<td>3</td>
</tr>
<tr>
<td>General Education</td>
<td>3</td>
<td>MN350</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>General Education</td>
<td>3</td>
<td>MN383</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td></td>
<td>Total</td>
<td>15</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course #</th>
<th>Fall Semester</th>
<th>Hrs</th>
<th>Spring Semester</th>
<th>Hrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>MN354</td>
<td>3</td>
<td></td>
<td>MN412</td>
<td>3</td>
</tr>
<tr>
<td>MN356</td>
<td>3</td>
<td></td>
<td>MN416</td>
<td>1</td>
</tr>
<tr>
<td>MN402</td>
<td>3</td>
<td></td>
<td>UI139</td>
<td>3</td>
</tr>
<tr>
<td>General Education</td>
<td>3</td>
<td>UI410</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>General Education</td>
<td>3</td>
<td>General Education</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>General Education</td>
<td>3</td>
<td>General Education</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td></td>
<td>Total</td>
<td>16</td>
</tr>
</tbody>
</table>

**Degree requirements for all students**: a minimum of 120 credit hours, completion of the General Education program, and completion of 39 senior division hours (300-599). Refer to the Undergraduate Bulletin or Degree Works for additional graduation requirements for your program.

Revised 6/1/2020