The M.S.Mfg.E. program emphasizes finding solutions for real-life manufacturing engineering problems while maintaining a solid theoretical basis. The program’s curriculum is composed of four concentrations.

**Core courses:**
Each student is expected to have core knowledge in key areas of Systems Engineering. All students are required to complete the following four core courses:

- MFG 5311 Design for Manufacturability
- MFG 5312 Strategic Design of Manufacturing Systems
- MFG 5321 Modeling and Analysis of Manufacturing Systems
- SE 5341 Systems Engineering Fundamentals

**Specialization Tracks / Prescribed Electives:**
Major concentration areas include: Advanced Manufacturing Systems, Analysis of Production Systems, Design of Manufacturing Processes, and a Customized track approved by the College of Engineering (COE).

- Advanced Manufacturing Systems
- Analysis of Production Systems
- Design of Manufacturing Processes
- Customized

**M.S.Mfg.E. - Advanced Manufacturing Systems**
Advanced manufacturing systems utilize innovative technology and system implementation to improve products and processes. Corporations and small enterprises need advanced manufacturing systems that integrate new and innovative technologies into both methods and processes in order to improve the performance of industrial production through the rapid transfer of science and technology into the manufacturing environment.

**M.S.Mfg.E. - Analysis of Production Systems**
This area focuses on the interaction of different components of manufacturing systems. The underlying idea is to analyze the entire system and strive for optimal design and operation. Particular emphasis is placed on discrete production systems. This area is divided into two concentrations: Design of Manufacturing Processes and Analysis of Discrete Production Systems. The Design of Manufacturing Processes is designed for students with undergraduate degree in Industrial and Manufacturing engineering. It focuses on tools and techniques of designing a new process for fabrication and/or assembly. The Analysis option focuses on the redesign/continuous improvement of existing manufacturing processes, and is designed for individuals with an industrial engineering/production and operations management background.
**M.S.Mfg.E. - Design of Manufacturing Processes**

In this area, students focus on analyzing individual components that build manufacturing systems as well as requirements imposed by the end product. This area is divided into two concentrations: Precision Engineering and Automation. Precision Engineering is focused on product and tool design, and CAD/CAM, and is therefore designed for individuals with a Manufacturing/Metallurgical/Chemical Engineering background. The Automation option deals with such areas as testing, robotics, industrial automation, and industrial controls, and thus this concentration is suited for Electrical and Mechanical engineers that desire to focus their skills in a manufacturing setting.

**M.S.Mfg.E. - CUSTOMIZED**

Some students have particular career goals for Master’s level specialization that are not covered by the above concentrations. For these students there is the non-designated M.S.Mfg.E. The student can choose to concentrate in technical management, operations research, etc. The student will work closely with the graduate advisor and the chair of his or her committee to layout a plan of the courses that will allow the student to specialize in the chosen area of concentration. This option can be particularly attractive to students whose undergraduate degree is in Engineering, Computer Science, Mathematics, or Science.

![MFG Program](image_url)

<table>
<thead>
<tr>
<th>CORE</th>
<th>Advanced Manufacturing Systems</th>
<th>Analysis of Production Systems</th>
<th>Design of Mfg. Processes</th>
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</thead>
<tbody>
<tr>
<td>Des. for Mfg. MFG5311</td>
<td>CAM MFG5359</td>
<td>Rel. &amp; Main. MFG5350</td>
<td>Adv. Qua. Cont. MFG5341</td>
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<td>SE Fund. SE5341</td>
<td>Elective</td>
<td>Elective</td>
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</tbody>
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**MFG Program CORE Des. for Mfg.**

- Des. for Mfg. MFG5311
- Mod. & Ana. of Mfg. Sys. MFG5321
- SE Fund. SE5341

**Thesis**