MANUFACTURING, MINOR

The Manufacturing minor is intended to provide our current undergraduates the skills and knowledge for successful careers in manufacturing systems and processes, and their practical applications ranging from manufacturing processes to other industries such as robotics, automotive and aerospace. Students will be exposed to applications of cyber-physical systems, robotics, and automated manufacturing as well as automotive and aerospace industries. Some of the skills required to pursue employment opportunities, which may be imparted through the manufacturing minor, include, but are not limited to, industrial safety practices and procedures; control of manufacturing processes; flexible manufacturing systems; process planning and optimization; robotic and automated manufacturing; and computer-integrated manufacturing/CAD/CAM integration.

The Manufacturing Minor requires 18 total credit hours, to include 12 required hours of coursework (listed below) and 6 hours of elective coursework.

<table>
<thead>
<tr>
<th>Code and Title</th>
<th>Hours</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>GES 255 or GES 400</td>
<td>Engineering Statistics I</td>
<td>3</td>
</tr>
<tr>
<td>MTE 271</td>
<td>Engr Mats: Struc Prop</td>
<td>3</td>
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<tr>
<td>ME 383</td>
<td>Modern Manufacturing Processes</td>
<td>3</td>
</tr>
<tr>
<td>ME 490</td>
<td>Mechanical Engr Design II (or equivalent Capstone Design Experience)</td>
<td>3</td>
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| Approved Electives | 6 |

Electives are offered on a regular schedule, but not necessarily every year. Students may choose from the list below or from a list of additional manufacturing minor electives available from the department. Some elective options include sequential courses (i.e. courses vary from 1 credit hour to 3 credit hours).

AEM 452 Composite Materials | 3
AEM 455 Nondestructive Evaluation | 3
CHE 493 Process Dynamics & Control | 3
EC 110 Principles of Microeconomics | 3
EC 112 Honors Prin of Microeconomics | 3
ME 421 Reliability & Maint. Engr. | 3
ME 577 Advanced Linear Control | 3
MTE 439 Metallurgy Of Welding | 3
ME 424 Automotive Manufacturing | 3
ME 430 Fuzzy Set Theory & Application | 3
ME 440 Failure of Engr Materials | 3
MFE 442 Adv Mat Sci and Add Processes | 3
MFE 473 Dis Sim of Manufacturing Sys | 3
MFE 483 Computer Aided Manufacturing | 3
MFE 485 Mod Manufacturing Practices II | 3
MFE 302 Advanced PLC | 1
MFE 303 Adv Auto & Matl Handling | 1
MFE 326 Process Monitoring and Control | 1
MFE 332 Quality Control In Manufac Sys | 3
MFE 338 Introduction to Industry 4.0 | 1
MFE 342 Fund of Materials Processing | 3
MFE 385 Metrology | 4
MFE 201 Basics of Robotics | 1
MFE 202 Basics of PLC | 1
MFE 203 Basics of Auto & Matl Handling | 1
MFE 222 Robotic Welding | 1
MFE 224 Industrial Auto with Robotics | 1
MFE 226 Instrumentation for Automation | 1
MFE 232 Flex Manufacturing Sys | 1
MFE 262 Intro Industrial Internt Thngs | 1
MFE 449 Powder Metallurgy | 3

Faculty
Professors
Jalili, Nader, Department Head
Agrawal, Ajay K.
Balasubramanian, Bharat
Krishnan, Sundar Rajan
Shen, Xiangrong
Shepard Jr., W. Steve
Srinivasan, Kalyan Kumar

Associate professors
Amini, Shahriar (Sean)
Ashford, Marcus D.
Bittle, Joshua A.
Fonseca, Daniel J.
Khandelwal, Bhupendra
Mahmoodi, S. Nima
Momeni, Kasra
Puzinauskas, Paulius V.
Todd, Beth Ann
Volkov, Alexey N.
Williams, Keith A.
Yoon, Hwan-Sik

Assistant professors
Carpenter, Joseph
Cousin, Christian, A.
Davami, Keivan
Kasemer, Matthew
Kim, Hyun Jin
Martelli, Dario
Pakniyat, Ali
Patiballa, Sree Kalyan
Samadi, Forooza
Shah, Krishna
Vikas, Vishesh

Instructors
Hill, Lawrence
Koutahzadeh, Negin
Scott, Radley

Adjunct professor
Daniewicz, Steve

Adjunct assistant professor
Rasoulzadeh, Mojdeh

Professor emeritus
Woodbury, Keith A.