## MANUFACTURING CONCENTRATION

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>IME 327</td>
<td>Test Design and Analysis in Manufacturing Engineering</td>
<td>4</td>
</tr>
<tr>
<td>ME 418</td>
<td>Implementation of Mechanical Controls</td>
<td>4</td>
</tr>
<tr>
<td>or ME 419</td>
<td>Advanced Control Systems</td>
<td></td>
</tr>
<tr>
<td>ME 428</td>
<td>Senior Design Project I</td>
<td>2</td>
</tr>
<tr>
<td>ME 429</td>
<td>Senior Design Project II</td>
<td>2</td>
</tr>
<tr>
<td>ME 430</td>
<td>Senior Design Project III</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>8</td>
</tr>
</tbody>
</table>

Take all of the courses in one of the following emphasis areas:

### Mechanical Manufacturing Emphasis Area

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>IME 330</td>
<td>Fundamentals of Manufacturing Engineering</td>
</tr>
<tr>
<td>IME 450</td>
<td>Manufacturing Process and Tool Engineering</td>
</tr>
</tbody>
</table>

### Electronics Manufacturing Emphasis Area

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>IME/MATE 458</td>
<td>Microelectronics and Electronics Packaging</td>
</tr>
<tr>
<td>MATE 430 &amp; MATE 435</td>
<td>Micro/Nano Fabrication and Microfabrication Laboratory</td>
</tr>
</tbody>
</table>

### Design and Manufacturing Elective

Select from the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>IME 330</td>
<td>Fundamentals of Manufacturing Engineering</td>
</tr>
<tr>
<td>IME 331</td>
<td>Intermediate Metal Casting</td>
</tr>
<tr>
<td>IME 335</td>
<td>Computer-Aided Manufacturing I</td>
</tr>
<tr>
<td>IME 356</td>
<td>Manufacturing Automation</td>
</tr>
<tr>
<td>IME 416</td>
<td>Automation of Industrial Systems</td>
</tr>
<tr>
<td>IME 418</td>
<td>Product-Process Design</td>
</tr>
<tr>
<td>IME 428</td>
<td>Engineering Metrology</td>
</tr>
<tr>
<td>IME 430</td>
<td>Quality Engineering</td>
</tr>
<tr>
<td>IME 432</td>
<td>Additive Manufacturing</td>
</tr>
<tr>
<td>IME 457</td>
<td>Advanced Electronic Manufacturing</td>
</tr>
<tr>
<td>IME/MATE 458</td>
<td>Microelectronics and Electronics Packaging</td>
</tr>
<tr>
<td>IME 527</td>
<td>Design of Experiments</td>
</tr>
<tr>
<td>IME 543</td>
<td>Applied Human Factors</td>
</tr>
<tr>
<td>MATE 430 &amp; MATE 435</td>
<td>Micro/Nano Fabrication and Microfabrication Laboratory</td>
</tr>
<tr>
<td>MATE 440 &amp; MATE 445</td>
<td>Welding Metallurgy and Joining of Advanced Materials Laboratory</td>
</tr>
<tr>
<td>ME 305</td>
<td>Introduction to Mechatronics</td>
</tr>
<tr>
<td>ME 412</td>
<td>Composite Materials Analysis and Design</td>
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</tbody>
</table>

**Total units: 25-27**

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1. ENGR 459, ENGR 460 and ENGR 461 (6) or ENGR 463, ENGR 464, and ENGR 465 (6) may substitute for ME 428, ME 429 and ME 430 (6).

2. ME 400 and ME 500 are independent study classes and may be acceptable for technical elective credit. A course substitution form is required.

3. If a course is taken to meet an Emphasis Area requirement, it cannot be double-counted as a Design and Manufacturing Elective.