

ME 311: Manufacturing Processes Laboratory

<i>Course description:</i>	Manufacturing processes laboratory in machining, welding, forming; manufacturing project.
<i>Number of credits:</i>	1 (0-3). This course is required.
<i>Course Coordinator:</i>	K. Hutchinson
<i>Prerequisites by course:</i>	ME 310 or concurrent enrollment; certified major in Mechanical Engineering
<i>Prerequisites by topic:</i>	<ol style="list-style-type: none">1. Stress-strain relationships2. Time-temperature transformation characteristics of metals3. Material hardness definitions and scales (i.e., Rockwell, Brinell)
<i>Postrequisites:</i>	ME 474, ME 475
<i>Textbooks/other required materials:</i>	None.
<i>Course objectives:</i>	To provide the student with personal, hands-on experience in the operation of standard machine tools, fundamentals of CNC operations including basic programming, introduction to CAM programming, testing procedures for material properties important in manufacturing, introduction to industrial robotics.
<i>Topics covered:</i>	<ol style="list-style-type: none">1. Conventional machine tool operation.2. CNC machine tool operation.3. CAM programming.4. Heat treatment processes.5. Precision measurement/Metrology.6. Operational introduction to industrial robotics.7. Geometric dimensioning and tolerancing (GD&T) and ASME Y14.5 standard.
<i>Expected learning outcomes:</i>	<ol style="list-style-type: none">1. Complete the fabrication four lab assignments-Conventional & CNC2. Know how to operate an engine lathe, milling machine, and drill press3. Understand basic operation of a vertical machining center, CNC lathes4. Know how to utilize precision measurement devices – micrometer, digital calipers, basics of GD&T5. Understand the relationship between heat treatment process and material properties
<i>Class schedule:</i>	None.
<i>Laboratory schedule:</i>	One 3-hour laboratory session per week, for one semester.

Contribution to meeting the Engineering Topics
professional component:

Relationship of course to student outcomes:

3 strongly supported; 2 supported; 1 minimally supported

Student Outcomes Pre-Fall 2018
(ABET EC2000)

a	b	c	d	e	f	g	h	i	j	k
2	3									2

Student Outcomes Fall 2018 forward
(ABET EC2019)

1	2	3	4	5	6	7
3					3	

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