

## 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)
<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"><li>1. Stress-strain relationships</li><li>2. Time-temperature transformation characteristics of metals</li><li>3. Material hardness definitions and scales (i.e., Rockwell, Brinell)</li></ol>
<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"><li>1. Conventional machine tool operation .</li><li>2. CNC machine tool operation.</li><li>3. CAM programming.</li><li>4. Heat treatment processes.</li><li>5. Precision measurement/Metrology.</li><li>6. Operational introduction to industrial robotics.</li><li>7. Geometric dimensioning and tolerancing (GD&amp;T) and ASME Y14.5 standard.</li></ol>
<i>Expected student outcomes:</i>	<ol style="list-style-type: none"><li>1. Complete the fabrication four lab assignments-Conventional &amp; CNC</li><li>2. Know how to operate an engine lathe, milling machine, and drill press</li><li>3. Understand basic operation of a vertical machining center, CNC lathes</li><li>4. Know how to utilize precision measurement devices – micrometer, digital calipers, basics of GD&amp;T</li><li>5. Understand the relationship between heat treatment process and material properties</li></ol>
<i>Class schedule:</i>	None.
<i>Laboratory schedule:</i>	One 3-hour laboratory session per week, for one semester.
<i>Contribution to meeting the professional component:</i>	Engineering Topics
<i>Relationship of course to program objectives:</i>	Meets: <ol style="list-style-type: none"><li>1. School of MME educational objectives: 1, 2</li><li>2. School of MME program outcomes: (a), (b), (k)</li><li>3. ABET EC2000, Criterion 3 program outcomes: (a), (b), (k)</li></ol>

Prepared by: Robert Hutchinson

Date: June 21, 2016

## **POLICIES**

### **A. Reasonable Accommodation** (the nature of the particular course determines which one applies):

- **Pullman Campus.** Reasonable accommodations are available for students with a documented disability. If you have a disability and need accommodations to fully participate in this class, please either visit or call the Access Center (Washington Building 217; 509-335-3417) to schedule an appointment with an Access Advisor. All accommodations MUST be approved through the Access Center.
- **WSU Online Course.** Reasonable accommodations are available in online classes for students with a documented disability. All accommodations must be approved through your WSU Disability Services office. If you have a disability and need accommodations, we recommend you begin the process as soon as possible. For more information contact a Disability Specialist on your home campus: Pullman or WSU Online (<http://accesscenter.wsu.edu>), Spokane (<http://spokane.wsu.edu/students/current/studentaffairs/disability/>), Tri-Cities (<http://www.tricity.wsu.edu/disability>), Vancouver (<http://studentaffairs.vancouver.wsu.edu/student-resource-center/disability-services>).

### **B. Academic Integrity**

WSU expects all students to behave in a manner consistent with its high standards of scholarship and conduct. Students are expected to uphold these standards both on and off campus and acknowledge the university's authority to take disciplinary action. The Standards of Conduct for Students can be found at <http://conduct.wsu.edu>.

### **C. WSU Safety**

WSU is committed to maintaining a safe environment for its faculty, staff, and students. Safety is the responsibility of every member of the campus community and individuals should know the appropriate actions to take when an emergency arises. In support of our commitment to the safety of the campus community the University has developed a Campus Safety Plan, <http://safetyplan.wsu.edu>. It is highly recommended that you visit this web site as well as the University emergency management web site at <http://oem.wsu.edu/> to become familiar with the information provided.