

ME 220: Materials Laboratory

<i>Course description:</i>	Mechanical behavior of materials and application to engineering structures.
<i>Number of credits:</i>	1 (0-3). This course is required.
<i>Course Coordinator:</i>	J.L. Ding
<i>Prerequisites by course:</i>	CE 215 or concurrent enrollment
<i>Prerequisites by topic:</i>	<ol style="list-style-type: none">1. Concepts of stress, strain, and their relationships.2. Axial, bending, torsion, shear loads, and their combinations.
<i>Postrequisites:</i>	MSE/ME 413; ME 316 (recommended)
<i>Textbooks/other required materials:</i>	Ding, J.L., Sheldon, G.L. <i>Mechanics of Materials Laboratory Notes</i> , WSU Cougar Copies.
<i>Course objectives:</i>	<ol style="list-style-type: none">1. To provide the students with hands-on experience in various material testing and experimental stress analysis methods, and engineering data analysis and report writing.2. To familiarize the students with various types of mechanical behavior in response to different loading conditions.
<i>Topics covered:</i>	<ol style="list-style-type: none">1. Tension test2. Impact test3. Fatigue test4. Stress wave experiment5. Torsion test6. Strain gages7. Combined stress analysis8. Photoelasticity
<i>Expected learning outcomes:</i>	<ol style="list-style-type: none">1. Gain hands-on experience in conducting tension, torsion, impact, and fatigue tests.2. Gain hands-on experience in using strain gages for one and two dimensional stress analysis.3. Be able to extract mechanical properties of materials from tension, torsion, impact, and fatigue test data.4. Appreciate the difference between the ductile and brittle behavior of materials and the environmental effects including temperature on such behavior.5. Be able to apply Hooke's law in one and two dimensional stress analysis.6. Be able to logically arrange, present, and summarize findings in a written report.
<i>Class schedule:</i>	One 50-minute lecture session every two weeks, for one semester.

Laboratory schedule: One 2-hour and 50-minute laboratory session every two weeks, for one semester.

Contribution to meeting the professional component: Engineering Topics

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
2		2			3	

Prepared by: Andrea Butcherite and J.L. Ding

Date: May 30, 2018