

ME 401: Mechanical Systems Laboratory
Fall Semester Only

Type (check one):	Required: <input checked="" type="checkbox"/> _____ Elective: _____
2005-2006 Catalog Data:	Laboratory experiments are performed in stress analysis and experimental mechanics on a project team basis. Emphasis is placed on experimental technique, data analysis and report preparation and presentation. Each student also prepares a state of the art report on a topic selected by the department faculty. <i>One semester; two credits</i>
Prerequisites:	ME 301
Co-Requisites:	ME 420
Textbook:	None
Other Required Materials:	None
Other References:	T.G. Beckwith, R.D. Marangoni, and J.H. Lienhard V., <i>Mechanical Measurements</i> , 5th edition, Addison-Wesley, 1993.
Instructor:	Dr. L. Michael Santi, Professor of Mechanical Engineering
Course Objectives:	<ol style="list-style-type: none">1. Provide a hands-on introduction to structural components and mechanical behavior of materials2. Develop skills in analysis and presentation of experimental data3. Develop ability to design and to execute engineering experiments
Prerequisites by Topics:	<ol style="list-style-type: none">1. Statics and dynamics of particles and rigid bodies2. Mechanical behavior of materials3. Instrumentation
Topics:	<ol style="list-style-type: none">1. Review of effective technical writing2. Review of effective presentation techniques3. Overview of statistics and uncertainty analysis4. Review of stress/strain relationships and stress concentrations5. Review of vibration theory6. Overview of experimental stress analysis techniques7. Miscellaneous laboratory assignments: stress and strain in engineering materials8. Miscellaneous laboratory assignments: structural components
Class Schedule:	Two 50-minute class sessions plus a 3-hour lab each week

Prepared by: Dr. L. Michael Santi

Date: 22-Aug-05

**Professional Component:
ME 401 – Mechanical Systems Laboratory**

Category (check one)	<input type="checkbox"/> Math/Basic Science <input checked="" type="checkbox"/> Engineering <input type="checkbox"/> General Education <input type="checkbox"/> Other
Design (check one)	<input type="checkbox"/> Significant <input checked="" type="checkbox"/> Some <input type="checkbox"/> None
Realistic Constraints (check all that apply)	<input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input type="checkbox"/> Sustainability <input checked="" type="checkbox"/> Manufacturability <input type="checkbox"/> Ethical <input checked="" type="checkbox"/> Health & Safety <input type="checkbox"/> Social <input type="checkbox"/> Political

Relationship to Program Outcomes:

Check all that apply:

- (a) an ability to apply knowledge of mathematics, science, and engineering
- (b) an ability to design and conduct experiments, as well as to analyze and interpret data
- (c) an ability to design a system, component, or process to meet desired needs
- (d) an ability to function on multi-disciplinary teams
- (e) an ability to identify, formulate, and solve engineering problems
- (f) an understanding of professional and ethical responsibility
- (g) an ability to communicate effectively
- (h) the broad education necessary to understand the impact of engineering solutions in a global and societal context
- (i) a recognition of the need for and an ability to engage in life-long learning
- (j) a knowledge of contemporary issues
- (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice