ME 401 – MECHANICAL SYSTEMS LABORATORY

Type (check one):	Required:____✓____ Elective:_____
2010-2011 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. Prerequisite: ME 301. Corequisite: ME 420. Offered in the Fall semester. *One semester; two credits*
Prerequisites:	ME 301
Co-Requisites:	ME 420
Textbook:	None
Other Required Materials:	None
Other References:	Patrick F. Dunn , *Measurment and data Analysis For Engineering and science*, 2th CRC Press, 2010.
Instructor:	James Aflaki, Ph.D., Associate Professor of Mechanical Engineering
Course Objectives:	1. Provide a hands-on introduction to structural components and mechanical behavior of materials 2. Develop skills in analysis and presentation of experimental data 3. Develop ability to design and to execute engineering experiments
Prerequisites by Topics:	1. Statics and dynamics of particles and rigid bodies 2. Mechanical behavior of materials 3. Instrumentation
Topics:	1. Review of effective technical writing 2. Review of effective presentation techniques 3. Overview of statistics and uncertainty Analysis 4. Review of stress/strain relationships and stress concentrations 5. Review of vibration theory 6. Overview of experimental stress analysis techniques 7. Miscellaneous laboratory assignments: stress and strain in engineering materials 8. Miscellaneous laboratory assignments: structural components
Class Schedule:	Two 50-minute class sessions plus a 3-hour lab each week

Prepared by:_____Dr. James Aflaki_____ **Date:**_____August 2011_____

Professional Component:
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Category (check one)	____Math/Basic Science ✓___Engineering ____General Education ____Other
Design (check one)	____Significant ✓___Some ____None
Realistic Constraints (check all that apply)	____Economic ____Environmental ____Sustainability ✓___Manufacturability ____Ethical ✓___Health & Safety ____Social ____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