

## MECHANICAL ENGINEERING PROGRAM

### ABET COURSE SYLLABUS

ME 302L : Materials Mechanics Lab (1 credit): Required Course

Course Description (2008-2010 Catalog):

Strain gage attachment and calibration, tensile testing of metals and non-metals, elastic constants, beam deflection and failure, torsion testing, column stability, and bolted connection testing.

Prerequisite Course: None

Corequisite: ME 302

Corequisite by Topic:

Mechanics of Materials

Textbook: None

Other Reference Material: On-Line Lab manual

Course Coordinator: Brendan O'Toole, Associate Professor

Course learning outcomes:

The primary objective for this course is to provide hands on experimental experience in characterizing mechanical properties of materials. Learning Outcomes will be:

- (a) Laboratory safety procedures and report writing skills
- (b) Uncertainty analysis of data (error propagation) and Statistical analysis of data
- (c) Specific standard test procedures for determining elastic and strength properties of materials for the following load conditions: axial, torsion, bending, and buckling.
- (d) Planning and executing an original experimental project in a group.

Relationship of Course to Mechanical Engineering Program Educational Outcomes:

Goal 1: Provide mechanical engineering graduates with technical capabilities.					Goal 2: Prepare the mechanical engineering graduates to have effective workplace skills.				Goal 3: Instilling a sense of responsibility as a professional member of society.			
1.a	1.b	1.c	1.d	1.e	2.a	2.b	2.c	2.d	3.a	3.b	3.c	3.d
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Topics Covered:

1. Lab Safety
2. Statistical and Uncertainty Analysis
3. Tensile Testing
4. Poisson's Ratio
5. Torsion
6. Flexural Modulus
7. Strain Gage Application
8. Beam Deflection
9. Group Projects
10. Column Loading

**Laboratory Projects:** This is a 1 credit lab course with predefined lab experiments and an original student designed group experimental project.

**Class/Laboratory Schedule:** 170 minutes one session per week

**Assessment of Student Progress toward Course Objectives**

Seven lab reports, one homework assignment, four quizzes, attendance/participation, and one group design report

**Class/Laboratory Schedule:** R 1:00 – 2:50 PM (Fall and Spring Semester) or

F 1:00 – 2:50 PM (Fall and Spring Semester)

**Contribution of Course for meeting Professional Component:**

- |  |           |
|--|-----------|
| (a) Mathematics and basic sciences:      | 0 credit  |
| (b) Engineering Topics (Design/Science): | 1 credit  |
| (c) General Education:                   | 0 credit  |
| (d) Others:                              | 0 credits |

**Prepared By:**

Brendan O'Toole

**Date:**

October 12, 2009