


Goals: This course familiarizes the students with the basics of experimental stress analysis through laboratory exercises. They learn how to use strain gauge rosettes, computer-based instrumentation to analyze structural deformations under different loading conditions, and experiment with fundamental strength measurements.

Coordinator: Peter B. Nagy, Professor of AsE/EM.

Prereq. by Topic: Basic Strength of Materials

Topics: 1. Mechanics of solids, tension, bending, torsion (4 hours)  
2. Computer-based instrumentation (2 hours)  
2. Strain gauge rosettes and bridges (1 hour)  
3. Tensile machine (1 hour)  
4. Beam columns, buckling (1 hour)  
5. Test (1 hour)

Computer Usage: Lab View, Virtual Bench

Laboratory Projects: 1. Displacement and strain measurements in a cantilever beam  
2. Strain measurements in a plate, rosettes, strain transformation (r)  
3. Torque transducer, moment transducer (r)  
4. Asymmetric bending, shear center (r)  
5. Maxwell's Reciprocity Theorem(r)  
6. Dynamic strains  
7. Uniaxial tension test  
8. Combined stress and strain (r)  
9. Beam-columns, column buckling

Estimated ABET Category Content: Engineering Science: 3 credits or 100%.  
Category Content: Engineering Design: none