

Course Learning Objectives **("to be able to do's")**

Course: ME 354 Mechanics of Materials Laboratory (required)

Course Coordinator: M. Jenkins **Interest Group** MMM

Catalog Description: Study of the properties and behavior of engineering materials, including stress-strain relations, strength, deformation, fracture, creep and cyclic fatigue. Introduction to experimental techniques common to structural engineering, interpretation of experimental data, comparison of measurements to numerical/analytical predictions, and formal engineering report writing.
(5 cr)

Course Overview: ME 354 involves the application of the fundamental mechanics of materials in "hands-on" laboratory exercises. The two pedagogical goals are (1) "to do" the exercises, observing and applying the aspects of mechanics of materials either learned in previous courses or introduced to in ME354, and (2) "to say" in formal and informal laboratory reports how basic concepts were applied laboratory exercises

Course Objectives: By the end of this course, the student will be able to:

- 1) List and explain applicable experimental methods for characterizing material and component behaviour
- 2) Compare (and quantify differences) measured experimental results and calculated theoretical values.
- 3) Predict component behaviour using experimental test results and engineering formulae
- 4) Analyze experimental data, theoretical models and their scalability to components
- 5) Analyze (deduce) the inherent variability of materials subjected to multiple modes of loading and apply the results to component behaviour.
- 6) Formulate a solution path for analyzing an actual multi-component structure using experimental, theoretical, and numerical tools/methods.
- 7) Evaluate the limits of structures by extending the experimental measurements using theoretical and numerical methods