MATERIALS & STRUCTURES
Learning Objectives and Outcomes
(Note that these are for the entire academic year -- both terms of Unified)

The overall LEARNING OBJECTIVES are that students graduating from Unified will be able to........

......use the one-dimensional structural idealizations/models of slender members (i.e. rods, simple beams, simple columns, and circular cross-section shafts) to determine stress and deformation states in structures, including trusses, beams, and shafts.

......apply the basic concepts of material properties and the underlying deformation and failure mechanisms in order to perform materials selection and preliminary sizing of the classes of structure previously noted.

......assess the applicability of such idealizations/models of materials and structures and the errors introduced in their use.

......with the MEASURABLE OUTCOMES that they are able to........

......explain the basic considerations of structural design.

......explain the basic assumptions underlying the idealizations/models of simple beams, columns, trusses, circular cross-section shafts, and material properties.

......apply a basic physical intuition for the function and sizing of structural elements and the selection of materials for use in them.

......calculate the two-dimensional stress and strain state at a point given three components of stress or strain.

......calculate the stress and strain distributions and deformation of simple structural idealizations/models (as previously mentioned).

......design/specify an internal structural configuration for simple trusses, beams, columns, and shafts in order to meet specified loading and deformation criteria.

......assess the conditions under which the structural idealizations/models previously mentioned cease to be applicable.