EGR 254: Mechanics of Materials and Structures

In this capstone course, the concepts of stress and strain caused by tensile, compression, shear and bending forces and the associated material behavior are studied. Classical and computer methods are used to analyze beams, trusses, and structures. Students also study centroids, centers of gravity, moments of inertia, torsion, column action and the strength of bolted and welded joints. The design of structural members made of wood, steel, and reinforced concrete is introduced. In the laboratory, students perform testing techniques used to analyze the mechanical properties of materials and evaluate structures. Prerequisite: EGR 251. Three lecture hours and three laboratory hours per week. Instructional Support Fee applies.

Course Student Learning Outcomes

1. Determine the Center of Gravity, Centroid and Moment of Inertia of a body. 2. Define the material properties important to engineering. 3. Determine beam strength and deflection using graphical integration and shear and moment diagrams. 4. Design wood, steel, and reinforced concrete structural members to withstand common loading conditions. 5. Analyze shafts, joints and columns under common loading conditions. 6. Determine properties of materials and structures using common experimental methods.
Credits: 4
Program: Engineering