

EGN 3331 - STRENGTH OF MATERIALS
Common Course Syllabus

Catalog Data: 3 CREDITS. Concepts of stress and strain; mechanical properties of materials, force, deformation and stress analysis of structural members; stress and strain transformations; principal stresses; failure theories; and concept of buckling.

Prerequisite: EGN 2311 – Statics or equivalent

Goals: This course will provide the student with both the theory and applications of the fundamental principles of mechanics of materials. Force, stress and deformation will be analyzed for various types of loading conditions. The concept of principal stresses and the static failure theories will be applied to safety analysis of structural members.

Topics:

1. Concepts of stress and strain (5 hours)
 2. Mechanical properties of materials (4 hours)
 3. Axial load, torsion, bending and shear, and combined loadings (20 hours)
 4. Stress and strain transformations, principal stresses and strains (8 hours)
 5. Deflection of beams and shafts (4 hours)
 6. Statically indeterminate problems (6 hours)
- (Total 47 hours)

Course Outcomes: (numbers in parentheses indicate correlation of the outcome with the appropriate ABET program outcomes 1-7)

1. The student will understand the concepts of stress and strain. (1,2,6)
2. The student will be able to conduct stress analysis for a member under axial load, torque, transverse load, or their combination. (1,2,6)
3. The student will learn the concept of principal stresses. (1,2,6)
4. The student will learn the concept of statically indeterminate structures, and be able to use the compatibility conditions to solve simple statically indeterminate problems. (1,2,6)
5. The student will be able to effectively communicate in writing a report. (3)

Design Content:

This course has no design content.

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