

Course Outline for: ENGR 2331 Deformable Body Mechanics

A. Course Description:

1. Number of credits: 3
2. Lecture hours per week: 3
3. Prerequisites: ENGR 2235 (C- or better)
4. Corequisites: None
5. MnTC Goals: None

This course is an introduction to the linear stress-strain behavior of engineering materials. Topics will include stresses due to uniaxial loading, bending and torsion; stress transformations, beam deflections, indeterminate structures and column buckling.

B. Date last reviewed/updated: October 2023

C. Outline of Major Content Areas:

1. Stresses and strains.
2. Material constitutive relationships.
3. Statically indeterminate structures.

D. Course Learning Outcomes:

Upon successful completion of the course, the student will be able to:

1. Interpret stress and strain information.
2. Perform stress transformations.
3. Calculate internal loads in beams.
4. Calculate stress due to tension.
5. Calculate stress in beams due to shear force.
6. Calculate stress in beams due to a bending moment.
7. Calculate stress in members with circular cross sections due to torsion.
8. Calculate the state of strain for any state of stress.
9. Calculate beam deflections under simple loading conditions.
10. Solve indeterminate structures.
11. Determine the conditions under which column buckling can occur.

E. Methods for Assessing Student Learning:

Methods for assessment may include, but are not limited to, the following:

1. Exams
2. Problem sets
3. Group projects

F. Special Information:

Students must have a graphing calculator.