

Common Course Outline for: ENGR 2331 Deformable Body Mechanics

A. Course Description

1. Number of credits: 3
2. Lecture hours per week: 3
Lab hours per week: 0
3. Prerequisites: ENGR 2235 (C or higher), MATH 1520 (C or higher), 2520 (C or higher) or concurrent enrollment.
4. Co-requisites: 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. 3 credits, lecture 3 periods.

B. Date last revised: April 2017

C. Outline of major content areas:

Stresses and strains, material constitutive relationships, statically-indeterminate structures.

D. Course Learning Outcomes:

Upon successful completion of this course, students should 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:

Student evaluation may include exams, problem sets, and group projects.

F. Special Information:

Students must have a graphing calculator

Relationship to ABET Accreditation Criteria: To assist our transfer partner engineering programs in their ABET accreditation evaluations, this course teaches skills that help students achieve the following ABET outcomes:

- (a) an ability to apply knowledge of mathematics, science, and engineering
- (e) an ability to identify, formulate, and solve engineering problems
- (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.