

1. CEE 3110 – Mechanics of Materials

2. Course credit hours: 3  
Contact hours per week: 3  
Credit category: Engineering Topics

3. Course coordinator: G. Ramirez

4. Textbook: *Mechanics of Materials*, Russell C. Hibbeler, 10<sup>th</sup> edition, Prentice-Hall Publishing Co., 2015

5. Course information:

2020 Catalog description	Stress, strain, Hooke's law, extension, torsion, and bending; beam deflections, column buckling, and combined stresses
Prerequisite(s)	C or better in CEE 2110
Course type	Required

6. Course instructional outcomes:

Course Outcome No.	Course Outcome (CO)	ABET Student Outcome
CO1	Calculate normal and shearing stresses on specified planes of members subjected to axial loads;	1
CO2	Calculate strains and deformations of members subjected to axial loads as well as to relate stresses to strains;	1
CO3	Calculate torsional shearing stresses and deformations of circular shafts subjected to torques;	1
CO4	Calculate bending stresses for a variety of beam cross sections and loading cases;	1
CO5	Understand and calculate beam transverse shearing stresses for any location in the beam cross section;	1
CO6	Combine diverse load cases and corresponding stresses to calculate maximum stress conditions;	1
CO7	Solve the basic differential equation governing beam behavior and compute elementary statically indeterminate beam reactions; and	1
CO8	Apply Euler's Equation to calculate column load capacity.	1

ABET criterion 3 Student Outcomes addressed by this course:

SO No.	Student Outcome (SO)
3.1	An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics

7. Course topics:

1. Axial stress and strain of tension members (10% classes)
2. Material properties (2.5%)

3. Analysis and design of circular and hollow circular shafts (10%)
4. Shear stress and bending stress for beams (15%)
5. Combined stresses (10%)
6. Analysis and design of pressure vessels (2.5%)
7. Stress transformation (15%)
8. Deflection of beams (15%)
9. Statically indeterminate structures (20%)
10. Analysis and design of columns (10%)
11. Tests (3 classes)

Program criteria (curriculum) addressed by this course:

1. Apply knowledge of mathematics through differential equations, calculus-based physics, chemistry, and at least one additional area of basic science.
  2. Analyze and solve problems in at least four technical areas appropriate to civil engineering.
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8. Additional topics, assignments, or requirements for dual-level (4000/5000) course:  
N/A
  9. Date: 02/25/2020