Code and Name: CE 211 – Solid Mechanics
Credit Hours: 3 (Lecture: 3, Tutorial: 1)

Textbook:
- Mechanics of Materials: Beer, F.P., Johnston, E.R, DeWolf, J.T. and Mazurek, D.F., 6th Edition, McGraw Hill, 2012
Other References:
- *Strength of Material: F. L. Singer and A. Pytal, 4th Edition, Harpercollins College Div.*
- *Course handouts: distributed on a regular basis to provide more information on the topic.*

Course Description:
Relationship between internal stresses and deformations produced by external forces acting on deformable bodies; design principles based on mechanics of solids; stresses and deformations produced by tensile, compressive, thermal, torsional, and flexural loading; stress concentration; stress transformation and Mohr's circle, failure criteria for plane stress; pressure vessels; buckling of columns.

Pre-requisites: MATH 235 Differential Equations, GE 103 Engineering Graphics and Design, GE 201 Statics, CE 210 Civil Engineering Materials
Co-requisites: None

Course Learning Outcomes:
With relation to ABET Student Outcomes (From Fall 2019-SOs: 1-7)
1. Apply and comprehend the basic theories and principles of solid mechanics (1)
2. Estimate the mechanical properties of engineering materials and concept of allowable stress & its use in engineering design (1)
3. Evaluate various types of stresses (axial, torsional, shear , flexural) in deformable bodies (1)
4. Analyze the deformations due to axial, shear, thermal and bearing stresses and the corresponding strains (1)
5. Develop numerical and reasoning skills to solve problems of stresses and strains in deformable bodies (1)
6. Evaluate the transformation of stresses and the concept of principle stresses (1)
7. Analyze the stability principles for long and short columns subjected to axial loads (1)
8. Construct the shear force and bending moment diagram of determinate beams subjected to various types of loading and to sketch resulting stresses in the beams (1)

Topics to be covered:
- Grasping the concept of internal forces due to applied external loads
- Knowledge of mechanical properties of engineering materials and concept of allowable stress & its use in engineering design
- Developing an understanding of stresses produced by external forces (i.e. axial, bending, shearing and torsional) and their determination at various locations inside the member
- Determination of principal stresses and transformation of stresses to arbitrary axis
- Comprehension of stability principles for columns

Grading Policy:
The grading for the course is: 60% coursework and 40% Final Exam. The course work consists of two Midterm Exams, where each midterm exam is worth 20%. It includes three quizzes having a total weightage of the remaining 20%.