COE 3001 Mechanics of Deformable Bodies (Required)

Catalog Description: COE 3001 Mechanics of Deformable Bodies (3-0-3)

Prerequisites: COE 2001 Statics (Minimum grade C)

Corequisites: MATH 2552 Differential Equations

Stress and strain analysis applied to beams, vessels, pipes, and combined loading; stress and strain transformations; beam deflection; column buckling.

Textbook: J. M. Gere and Barry J. Goodno, *Mechanics of Materials*, 9th Edition, Cengage Learning, 2013.

Topics Covered:

1. Definition of stress and strain
2. Deformation of axially loaded members
3. Thermal deformation
4. Torsion of circular bars
5. Shear force and bending moment diagrams
6. Normal stress in beams
7. Properties of sections
8. Shear stress in beams
9. Built-up beams
10. Elastic-perfectly plastic
11. Unsymmetric bending
12. Beam deflection
13. Curvature and beam deflection equation
14. Stress and strain transformation at a point
15. Principal stresses and maximum shear stress
16. Mohr's circle
17. Principal stresses in beams
18. Combined bending and axial loading
19. Column buckling

Course Outcomes:

Outcome 1: Students will apply skills learned in statics and mathematics to solve mechanics of solids problems.

Outcome 2: Students will demonstrate an ability to set up and solve strength of materials problems such as beam bending and stress transformation.

Correlation between Course Outcomes and Student Outcomes:

COE 3001											
	Mechanical Engineering Student Outcomes										
Course Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Outcome 1	X				X						X
Course Outcome 2	X				X						X

GWW School of Mechanical Engineering Student Outcomes:

(a) an ability to apply knowledge of mathematics, science and engineering

(b) an ability to design and conduct experiments, as well as to analyze and interpret data

(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability

(d) an ability to function on multidisciplinary teams

(e) an ability to identify, formulate, and solve engineering problems

(f) an understanding of professional and ethical responsibility

(g) an ability to communicate effectively

(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context

(i) a recognition of the need for, and an ability to engage in life-long learning

(j) a knowledge of contemporary issues

(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

Prepared by: Chaitanya Deo, 05/19/2017