CE C30 / ME C85: Introduction to Solid Mechanics
Summer 2015 – Online Offering

Textbooks:

1. *Engineering Mechanics 1: Statics* by Gross, Hauger, Schröder, Wall, and Rajapakse: Springer. 2nd edition published 2013. ISBN: 9783642303180; there is an optional solution manual for this book available electronically from Amazon: *Engineering Mechanics 1, Supplementary Problems: Statics*

2. *Engineering Mechanics of Deformable Solids* by Govindjee: Oxford University Press, ISBN: 9780199651641

Topics Covered:

1. Review of static equilibrium for rigid bodies
2. Concurrent forces: A special case
3. Application of statics for systems with moments
4. Theory of alternate reference points
5. Equivalent force systems
6. Distributed forces
7. Applications of statics: Complex systems
8. Introduction to deformable bodies
9. 1-D Stress, Strain, Equilibrium, Constitution
10. Axial Response
11. Axial Response by direct integration
12. Conservation of Energy and Stress Based Design
13. General Concepts of Stress
14. Polar and Spherical Stresses

15. General Concepts of Strain
16. Generalized Hooke's Law
17. Axial loading as a multi-dimensional phenomena
18. Thin walled pressure vessels and St. Venant's Principle
19. Kinematics and Equilibrium of Torsion
20. Torsion of Circular Elastic Bars
21. Thin-Walled Torsion
22. Kinematics of Bending
23. Equilibrium of Bending
24. Elastic Response of Beams
25. Beam beflections by Integration
26. Multi-axis Bending
27. Shear Stresses in Beams
28. Transformation of Vectors and Tensors
29. Eigenvalues and Eigenvectors
30. Mohr's Circle of Stress
31. Transformation of Strain
32. Yield and Fracture Criteria
33. Stability: Introduction
34. Euler Loads for Columns