Course Outline

1. Introduction: Jan 12 - Jan 14, 2004
   - Fundamental Concepts of Mechanics of Materials 1.1-1.2
   - Review of Static Equilibrium 1.4

2. Stress and Strain, Design: Jan 16 - Jan 30, 2003
   - Normal Stress 2.1-2.2
   - Extensional Strain 2.3
   - Normal Stress-Strain Diagrams 2.4
   - Elasticity and Plasticity 2.5
   - Linear Elasticity, Hooke’s Law and Poisson’s Ratio 2.6
   - Shear Stress and Shear Strain 2.7
   - Stresses on an Inclined Plane 2.8
   - Generalized Hooke’s Law (E, ν, G, K) 2.10
   - Allowable Stress Design 2.12
3. Axial Deformation: Feb 2 - 9, 2004
   - Axial Deformation of Uniform and Non-Uniform Bars 3.1-3.3
   - Stiffness and Flexibility of Uniform Bars 3.4
   - Serial and Parallel Axial Bar Assemblies (Composite Bars) 3.5

Midterm #1: Feb 11, 2004

4. Torsion: Feb 13 - 25, 2004
   - Elastic Torsion of Circular Bars 4.1-4.3
   - Serial and Parallel Torsion Bar Assemblies (Composite Torsion Bar) 4.4-4.5
   - Inelastic Torsion of Circular Bars 4.9

   - Equilibrium using Free Body Diagrams 5.1-5.2
   - Differential Equilibrium Relationships 5.3
   - Interrelationship of Shear Force and Bending Moment Diagrams 5.4

Midterm #2: March 17, 2004

6. Stresses in Beams: March 5 - March 19, 2004
   - Kinematics of Bending: Euler-Bernoulli Theory 6.1-6.2
   - Flexural Stresses in Elastic Beams 6.3
   - Allowable Stress Design of Beams, Elastic Section Modulus 6.4

Midterm #3: April 14, 2004

7. Deflections of Beams: March 29 - April 9, 2003
   - Elastic Moment-Curvature Relation 7.1
   - Differential Equations of Beam Deflection 7.2
   - Deflection Analysis by Direct Integration 7.3
   - Statically Indeterminate Deflection Problems 7.4

Midterm #3: April 14, 2004

8. Transformation of Stress and Mohr’s Circle: April 12 - 21, 2004
   - Transformation Relationships of Plane Stress 8.1-8.3
   - Principal Stresses and Maximum Shear Stress 8.4
   - Mohr’s Circle for Plane Stress 8.5

9. Stresses due to Combined Loading: April 23 - April 30, 2004
   - Thin-Walled Pressure Vessels 9.1-9.2
   - Stresses in Frame Members due to N, M, and V (Combined Loading) 9.4