CEC30/MEC85 - Introduction to Solid Mechanics

COURSE SYLLABUS

Date	Topic	Reading
1/20	Introduction	1.1
1/22	Review of vector algebra	1.2
1/25	Forces and moments in two dimensions	1.3, 1.4
1/27	Moments in three dimensions	1.3, 1.4
1/29	Rigid bodies, force/moment equivalence	1.5
2/1	Particle statics	2.1
2/3	Equilibrium of rigid bodies in two dimensions	2.2
2/5	Constraints and free-body diagrams	2.2
2/8	Friction	2.2
2/10	Equilibrium of rigid bodies in three dimensions	2.3
2/12	Forces in two-dimensional trusses (method of joints)	3.1, 3.2
2/17	Forces in two-dimensional trusses (method of sections)	2.4, 3.2
2/19	Frames and machines, method of sections	3.4
2/22	Chains and cables	3.5
2/24	Normal stress, Saint-Venant's principle	4.1
2/25	Midterm examination (through 2/17)	
2/26	Shear stress, stress-based design	4.2, 4.3
2/29	Local equilibrium equations in 2 and 3 dimensions	4.4, 4.5
3/2	Stress transformation	4.6
3/4	Principal stresses and maximum shear in plane stress	4.6
3/7	Mohr's circle and absolute maximum shear	4.6
3/9	Deformation and axial strain	5.1
3/11	Shear strain, general state of strain	5.2, 5.3
3/14	Strain transformation, principal strains, displacement	5.4
3/16	Linear elasticity, isotropy	6.1, 6.2
3/18	Elongation of axially loaded bars	6.3
3/28	Static indeterminacy, thermal strains/stresses	6.4, 6.6
3/30	Work and energy	6.5
4/1	Torsion of elastic circular bars	4.3.3, 7.1
4/4	Torsion of thin-walled tubes and composite shafts	7.2, 7.3
4/6	Shear and moment diagrams	8.1
4/7	Midterm examination (through 3/28)	
4/8	Pure bending of beams	8.2
4/11	Bernoulli–Euler beam theory	8.3
4/13	Deflection of beams	8.4
4/15	Deflection of beams with singular loads	8.4, App. A
4/18	Asymmetric bending of beams	9.2
4/20	Shear stresses in beams	9.3
4/22	Superposition; bending, shear and axial loading in beams	9.4
4/25	Stability of elastic systems	10.1, 10.2
4/27	Column buckling	10.3
4/29	Inelastic behavior and material failure	11.1, 11.2, 11.3
5/2	Review and closure	
5/9	Final examination	