

**SYLLABUS - MECHANICS AND THEORY OF STRUCTURES - SPRING 2005**  
**updated on 24 February 2005**

	Wk	D	Sec.	
				<b>Introduction</b>
31-Jan	1	M	1	Class organization, review, introduction
				<b>External Reactions of Structures (Exercises in Efficient Equilibrium)</b>
		T	2.1-2.5	Idealization, Determinacy and Stability, Equilibrium
		W	2.5	Beams and simple frames
		R		<i>Workshop: determinacy and external equilibrium equations</i>
7-Feb	2	M	3.1-3.2, 5.1-5.5	Cables, Arches, Trusses - external reactions
				<b>Internal Forces (and P, V, M Diagrams)</b>
		T	3.3-3.5	Truss analysis (statically determinate) internal forces
		W		"
		R		<i>Workshop: external equilibrium and truss analysis</i>
14-Feb	3	M	4.1-4.3, 8.1	Beams internal forces: axial, shear, and moment + deflection
		T	4.4-4.5	(cont.)
		W	5.1-5.5	Frames internal forces: axial, shear, and moment + deflection
		R		<i>Workshop: axial, shear, and moment diagrams</i>
21-Feb	4	M		(cont.)
				<b>Internal Stresses (<math>\sigma</math>, <math>\tau</math> and Mohr's Circle)</b>
		T	Riley 10	Stress (strain) transformation
		W	Riley 8	Internal forces to internal stresses, stress combinations
		R		<i>Workshop: P,V,M diagrams</i>
28-Feb	5	M		" + Mohr's circle
				<b>Deflections of Determinate Structures</b>
		T	8.2-8.3	Beam Theory, Integration Methods
		W	8.3	Integration Methods (cont.)
		R		<i>Workshop: Mohr's circle, integration for deflection</i>
7-Mar	6	M		<i>Review session</i>
		T		<i>Mid-term examination (through double integration)</i>
		W	8.5	Conjugate beam for deflection determination
		R		<i>Workshop: Conjugate beam, in-class homework</i>
14-Mar				<i>Spring Break</i>
				<b>Energy methods</b>
21-Mar	7	M		Exam review and post-spring break <i>revival of knowledge</i>
		T	8.6-8.7	External Work and Internal Strain Energy
		W	8.8-8.9	Virtual Work, Trusses
		R		<i>Workshop: Energy and virtual work for trusses</i>
28-Mar	8	M	8.10	Virtual Work, Beams and Frames
		T	8.11	Virtual Work, axial, shear, torsion, temperature
		W		"
		R		<i>Workshop: Virtual work trusses, beams, frames</i>
4-Apr	9	M	8.12, 8.13	Castigliano, application to trusses
		T	8.14	Castigliano beams and frames
		W		"
		R		<i>Workshop: Castigliano for trusses, beams, and frames</i>
				<b>Indeterminate Structural Analysis (The Classics)</b>
				<b>Approximate analysis</b>
11-Apr	10	M	7.1-7.3	truss approximations, assumed hinge locations
		T	7.3	" + building-vertical
		W	7.4-7.6	Buildings-lateral: Portal method, cantilever method
		R		<i>Workshop: Approximate analysis methods</i>
				<b>Flexibility (Force) Methods</b>
18-Apr	11	M	9.1-9.4	Intro. to indet. analysis, Solution procedure, beams
		T	9.4-9.5	beams, frames
		W	9.6	trusses
		R		<i>Workshop: Flexibility methods (forces)</i>
25-Apr	12	M	TBA	deformations of indeterminate trusses (virtual work, ...)
		T	TBA	" + beams
		W	9.8	" + frames, and generalizations
		R		<i>Workshop: Flexibility methods (forces and displacements)</i>
				<b>Stiffness (Displacement) Methods</b>
2-May	13	M	10.1-10.2	Slope-deflection derivation and procedure
		T	10.3	Analysis of beams
		W		Generalized methods - connections to future courses
		R		<i>Workshop: slope-displacement solutions</i>
13-May		F		<i>Final examination</i>