

## Lesson Plan

Name of Institute	: Ambala College of Engineering and Applied Research
Name of the Faculty member	: Er. Rupen Trehan (Assistant Professor)
Discipline	: Mechanical Engineering
Semester	: 4 <sup>th</sup>
Subject	: Mechanics of Solids-II (MEC-206 A)
Lesson Plan Duration	: 15 weeks (from Jan 2026 to May 2026)
Work Load	: L-3 T-1 P-0

Week	Theory		Practical	
	Lecture day	Topic (including assignment/test)	Practical day	Topic
1 <sup>st</sup>	1 <sup>st</sup>	<b>UNIT-I Strain Energy &amp; Impact Loading:</b> Definitions.	1 <sup>st</sup>	
	2 <sup>nd</sup>	Expression for strain energy stored in a body when load is applied gradually.		
	3 <sup>rd</sup>	Expression for strain energy stored in a body when load is applied suddenly/with impact.		
	4 <sup>th</sup>	Numericals.		
2 <sup>nd</sup>	5 <sup>th</sup>	Strain energy of beams in bending.	2 <sup>nd</sup>	
	6 <sup>th</sup>	Strain energy of beams in bending.		
	7 <sup>th</sup>	Beam deflections.		
	8 <sup>th</sup>	Numericals.		
3 <sup>rd</sup>	9 <sup>th</sup>	Strain energy of shafts in twisting. Energy methods in determining spring deflection.	3 <sup>rd</sup>	
	10 <sup>th</sup>	Castigliano's theorem.		
	11 <sup>th</sup>	<b>Theories of Elastic Failures:</b> Various theories of elastic failures with derivations and graphical representations.		
	12 <sup>th</sup>	Numericals.		
4 <sup>th</sup>	13 <sup>th</sup>	Applications to problems of 2- dimensional stress system with (i) Combined direct loading and bending.	4 <sup>th</sup>	
	14 <sup>th</sup>	Applications to problems of 2- dimensional stress system with (ii) combined torsional and direct loading. Assignment.		
	15 <sup>th</sup>	Numericals.		
	16 <sup>th</sup>	Numericals.		
5 <sup>th</sup>	17 <sup>th</sup>	Numericals.	5 <sup>th</sup>	
	18 <sup>th</sup>	<b>UNIT-II Thin Walled Vessels:</b> Hoop & Longitudinal stresses & strains in cylindrical vessels & their derivations under internal pressure.		
	19 <sup>th</sup>	Hoop & Longitudinal stresses & strains in cylindrical vessels & their derivations under internal pressure.		
	20 <sup>th</sup>	Numericals.		
6 <sup>th</sup>	21 <sup>st</sup>	Hoop & Longitudinal stresses & strains in spherical vessels & their derivations under internal pressure.	6 <sup>th</sup>	
	22 <sup>nd</sup>	Hoop & Longitudinal stresses & strains in spherical vessels & their derivations under internal pressure.		
	23 <sup>rd</sup>	Wire wound cylinders.		
	24 <sup>th</sup>	Numericals.		
7 <sup>th</sup>	25 <sup>th</sup>	<b>Thick Cylinders &amp; Spheres:</b> Derivation of Lamé's equations.	7 <sup>th</sup>	
	26 <sup>th</sup>	Derivation of Lamé's equations.		
	27 <sup>th</sup>	Radial & hoop stresses and strains in thick subjected to internal fluid pressure only.		
	28 <sup>th</sup>	Numericals.		

8 <sup>th</sup>	29 <sup>th</sup>	Radial & hoop stresses and strains in compound cylinders subjected to internal fluid pressure only.	8 <sup>th</sup>	
	30 <sup>th</sup>	Radial & hoop stresses and strains in compound cylinders subjected to internal fluid pressure only.		
	31 <sup>st</sup>	Radial & hoop stresses and strains in spherical shells subjected to internal fluid pressure only.		
	32 <sup>nd</sup>	Numericals.		
9 <sup>th</sup>	33 <sup>rd</sup>	Hub shrunk on solid shaft.	9 <sup>th</sup>	
	34 <sup>th</sup>	Numericals.		
	35 <sup>th</sup>	UNIT-III <b>Rotating Rims &amp; Discs:</b> Stresses in uniform rotating rings & discs.		
	36 <sup>th</sup>	Numericals.		
10 <sup>th</sup>	37 <sup>th</sup>	Rotating discs of uniform strength.	10 <sup>th</sup>	
	38 <sup>th</sup>	Stresses in (i) rotating rims, neglecting the effect of spokes.		
	39 <sup>th</sup>	Stresses in (ii) rotating cylinders, hollow/ solid cylinders. Assignment		
	40 <sup>th</sup>	Numericals.		
11 <sup>th</sup>	41 <sup>st</sup>	Numericals.	11 <sup>th</sup>	
	42 <sup>nd</sup>	<b>Springs:</b> Stresses in closed coiled helical springs.		
	43 <sup>rd</sup>	Stresses in open coiled helical springs subjected to axial loads and twisting couples.		
	44 <sup>th</sup>	Numericals.		
12 <sup>th</sup>	45 <sup>th</sup>	Leaf springs.	12 <sup>th</sup>	
	46 <sup>th</sup>	Flat spiral/ Concentric springs.		
	47 <sup>th</sup>	UNIT-IV <b>Bending of Curved Bars:</b> Stresses in bars of initial large radius of curvature.		
	48 <sup>th</sup>	Numericals.		
13 <sup>th</sup>	49 <sup>th</sup>	Stresses in bars of initial small radius of curvature. Stresses in crane hooks.	13 <sup>th</sup>	
	50 <sup>th</sup>	Stresses in rings of circular & trapezoidal sections.		
	51 <sup>st</sup>	Deflection of curved bars & rings.		
	52 <sup>nd</sup>	Numericals.		
14 <sup>th</sup>	53 <sup>rd</sup>	Deflection of rings by Castigliano's theorem.	14 <sup>th</sup>	
	54 <sup>th</sup>	Stresses in simple chain links, deflection of simple chain links.		
	55 <sup>th</sup>	<b>Unsymmetrical Bending:</b> Introduction to unsymmetrical bending. Stresses due to unsymmetrical bending. Deflection of beam due to unsymmetrical bending.		
	56 <sup>th</sup>	Numericals.		
15 <sup>th</sup>	57 <sup>th</sup>	Shear center for angle and channel sections. Assignment.	15 <sup>th</sup>	
	58 <sup>th</sup>	Numericals.		
	59 <sup>th</sup>	Shear center for I-sections. Numerical.		
	60 <sup>th</sup>	Numericals.		