

# LESSON PLAN

**DEPARTMENT OF MECHANICAL ENGINEERING, ITT, CHOUDWAR**

**SUBJECT:** TH-2 STRENGTH OF MATERIAL **Periods:** 4 per week **SEMESTER:** 3<sup>rd</sup>

**NAME OF FACULTY:** GURU PRASAD SAHOO, LECTURER(MECH) **No. of weeks:** 15

Week	Class Day	Theory / Practical Topics
1 <sup>st</sup>	1 <sup>st</sup>	Simple stress & strain 1.1 Types of load, stresses & strains, (Axial and tangential) Hooke's law,
	2 <sup>nd</sup>	Young's modulus, bulk modulus, modulus of rigidity
	3 <sup>rd</sup>	Poisson's ratio
	4 <sup>th</sup>	derive the relation between three elastic constants
2 <sup>nd</sup>	1 <sup>st</sup>	Principle of super position, stresses in composite section
	2 <sup>nd</sup>	Temperature stress, determine the temperature stress in composite bar (single core)
	3 <sup>rd</sup>	Strain energy and resilience, Stress due to gradually applied
3 <sup>rd</sup>	4 <sup>th</sup>	suddenly applied and impact load
	1 <sup>st</sup>	Simple problems on above
	2 <sup>nd</sup>	Simple problems on above
	3 <sup>rd</sup>	Definition of hoop and longitudinal stress, strain
4 <sup>th</sup>	4 <sup>th</sup>	Derivation of hoop stress, longitudinal stress, hoop strain
	1 <sup>st</sup>	longitudinal strain and volumetric strain
	2 <sup>nd</sup>	Computation of the change in length, diameter and volume
	3 <sup>rd</sup>	Simple problems on above
5 <sup>th</sup>	4 <sup>th</sup>	Simple problems on above
	1 <sup>st</sup>	Determination of normal stress, shear stress and resultant stress on oblique plane
	2 <sup>nd</sup>	Location of principal plane and computation of principal stress
	3 <sup>rd</sup>	Location of principal plane and computation of principal stress
6 <sup>th</sup>	4 <sup>th</sup>	Maximum shear stress using Mohr's circle
	1 <sup>st</sup>	Bending moment & shear force - Types of beam and load
	2 <sup>nd</sup>	Concepts of Shear force and bending moment
	3 <sup>rd</sup>	Shear Force and Bending moment diagram and its salient features illustration in cantilever beam
7 <sup>th</sup>	4 <sup>th</sup>	simply supported beam and over hanging beam under point load and uniformly distributed load
	1 <sup>st</sup>	Revision
	2 <sup>nd</sup>	Revision
	3 <sup>rd</sup>	Theory of simple bending - Assumptions in the theory of bending
8 <sup>th</sup>	4 <sup>th</sup>	Solve simple problems
	1 <sup>st</sup>	Bending equation, Moment of resistance
	2 <sup>nd</sup>	Section modulus & neutral axis
	3 <sup>rd</sup>	Solve simple problems
9 <sup>th</sup>	4 <sup>th</sup>	Solve simple problems
	1 <sup>st</sup>	Revision
	2 <sup>nd</sup>	Combined direct & bending stresses - Define column
	3 <sup>rd</sup>	Combined direct & bending stresses - Define column
10 <sup>th</sup>	4 <sup>th</sup>	Revision
	1 <sup>st</sup>	Combined direct & bending stresses - Define column
	2 <sup>nd</sup>	Combined direct & bending stresses - Define column
	3 <sup>rd</sup>	Eccentric load on column
	4 <sup>th</sup>	Eccentric load on column

11 <sup>th</sup>	1 <sup>st</sup>	Revision
	2 <sup>nd</sup>	Axial load
	3 <sup>rd</sup>	Axial load
	4 <sup>th</sup>	Bending stresses
12 <sup>th</sup>	1 <sup>st</sup>	Bending stresses
	2 <sup>nd</sup>	Direct stresses
	3 <sup>rd</sup>	Direct stresses
	4 <sup>th</sup>	Maximum & Minimum stresses. Numerical problems on above
13 <sup>th</sup>	1 <sup>st</sup>	Maximum & Minimum stresses. Numerical problems on above
	2 <sup>nd</sup>	Buckling load computation using Euler's formula (no derivation) in Columns with various end conditions
	3 <sup>rd</sup>	Buckling load computation using Euler's formula (no derivation) in Columns with various end conditions
	4 <sup>th</sup>	Revision
14 <sup>th</sup>	1 <sup>st</sup>	Torsion - Assumption of pure torsion
	2 <sup>nd</sup>	Assumption of pure torsion
	3 <sup>rd</sup>	Assumption of pure torsion
	4 <sup>th</sup>	The torsion equation for solid and hollow circular shaft
15 <sup>th</sup>	1 <sup>st</sup>	The torsion equation for solid and hollow circular shaft
	2 <sup>nd</sup>	Comparison between solid and hollow shaft subjected to pure torsion
	3 <sup>rd</sup>	Comparison between solid and hollow shaft subjected to pure torsion
	4 <sup>th</sup>	Revision



Sign. of Faculty