

## TEACHING PLAN FOR THEORY

Name of Subject Teacher: **GIRISH JOSHI**

<b>Subject: Theory of Plasticity</b>		<b>Class: Class: M.E.(Third Semester) Branch: CIVIL</b>
<b>Lecture No</b>	<b>Scheduled Date</b>	
1		Module 1: Basic equations of theory of elasticity: Index notation, equations of equilibrium
2		Constitutive relations for isotropic bodies, strain-displacement relations
3		Compatibility, displacement and traction boundary conditions
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5		Admissibility of displacement and stress fields, plane stress and plane strain problems
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7		Module 2: Plastic behaviour in simple tension, generalisation of results in simple tension
8		Yield surfaces, uniqueness and stability postulates
9		Convexity of yield surface and normality rule, limit surfaces. Initial Yield Surfaces for Polycrystalline Metals: Summary of general form of plastic constitutive equations
10		Convexity of yield surface and normality rule, limit surfaces. Initial Yield Surfaces for Polycrystalline Metals: Summary of general form of plastic constitutive equations
11		Hydrostatic stress states and plastic volume change in metals, shear stress on a plane, the von Mises initial yield condition
12		The Tresca initial yield condition, consequences of isotropy.
13		Module 3: Plastic Behaviour under Plane Stress Conditions: Initial and subsequent yield surfaces in tension-torsion

14	The isotropic hardening model, the kinematic hardening model, yield surfaces made of two or more yield functions
15	Piecewise linear yield surfaces, elastic perfectly plastic materials. Plastic Behaviour of Bar Structures - Behaviour of a three bar truss
16	Behaviour of a 39/44 beam in pure bending, simply supported beam subjected to a central point load
17	fixed beams of an elastic perfectly plastic material, combined bending and axial force
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19	Module 4: Theorems of Limit Analysis - Alternative statement of the limit theorems
20	The specific dissipation function, cold bending of bar beyond elastic limit
21	Spring back, plastic bending with strain hardening material, plastic bending of wide plate
22	Limit Analysis in Plane Stress and Plane Strain: Discontinuities in stress and velocity fields
23	The Tresca yield condition in plane stress and plane strain, symmetrical internal and external notches in a rectangular bar
24	The punch problem in plane strain, remarks on friction