

Discipline :MECHANICAL ENGG.	Semester :3 rd	Name of the Teaching Faculty: PRAVAT KUMAR SWAIN
SUBJECT: STRENGTH OF MATERIAL (TH-2)	No. of days/per week class allotted: 04	Semester From Date:01.07.2024 To Date:8.11.2024 No. of Weeks:15
Week	Class Day	Theory Topics
1 st	1 st	1.Simple stress & strain
	2 nd	• Types of load, stresses & strains, (axial and tangential), • Hooke's law, young's modulus, bulk modulus, modulus of rigidity,
	3 rd	• Poisson's ratio, derive the relation between three elastic constants
	4 th	• Principle of super position, stresses in composite section
2 nd	1 st	• Temperature stress, determine the temperature stress in composite bar (single core)
	2 nd	• Strain energy and resilience, stress due to gradually applied, suddenly applied and impact load
	3 rd	• Strain energy and resilience, stress due to gradually applied, suddenly applied and impact load
	4 th	• Simple problems on above
3 rd	1 st	• Simple problems on above
	2 nd	• Simple problems on above
	3 rd	2.Thin cylindrical and spherical shell under internal pressure • -Definition of hoop and longitudinal stress, Strain
	4 th	• Definition of hoop and longitudinal stress, strain
4 th	1 st	• Derivation of hoop stress, longitudinal stress, hoop strain, longitudinal strain and volumetric strain
	2 nd	• Derivation of hoop stress, longitudinal stress, hoop strain, longitudinal strain and volumetric strain
	3 rd	• Computation of the change in length, diameter and volume
	4 th	• Simple problems on above
5 th	1 st	• Simple problems on above
	2 nd	• CLASS TEST
	3 rd	3. Two dimensional stress systems • Determination of normal stress, shear stress and resultant stress on oblique plane
	4 th	• Determination of normal stress, shear stress and resultant stress on oblique plane
6 th	1 st	• Determination of normal stress, shear stress and resultant stress on oblique plane
	2 nd	• Location of principal plane and computation of principal stress
	3 rd	• Location of principal plane and computation of principal stress
	4 th	• Location of principal plane and computation of principal stress
	1 st	• Location of principal plane and computation of principal stress and maximum shear stress using Mohr's circle

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7 th	2 nd	<ul style="list-style-type: none"> • Location of principal plane and computation of principal stress and maximum shear stress using Mohr's circle
	3 rd	<ul style="list-style-type: none"> • Location of principal plane and computation of principal stress and maximum Shear stress using Mohr's circle
	4 th	<ul style="list-style-type: none"> • Location of principal plane and computation of principal stress and maximum Shear stress using Mohr's circle
8 th	1 st	4. Bending moment & shear force <ul style="list-style-type: none"> • Types of beam and load
	2 nd	<ul style="list-style-type: none"> • Types of beam and load
	3 rd	<ul style="list-style-type: none"> • Types of beam and load
	4 th	<ul style="list-style-type: none"> • Concepts of shear force and bending moment
9 th	1 st	<ul style="list-style-type: none"> • Concepts of shear force and bending moment
	2 nd	<ul style="list-style-type: none"> • Concepts of shear force and bending moment
	3 rd	<ul style="list-style-type: none"> • Shear force and bending moment diagram and its salient features illustration in cantilever beam, simply supported beam and overhanging beam under point load and uniformly distributed load
	4 th	<ul style="list-style-type: none"> • Shear force and bending moment diagram and its salient features illustration in cantilever beam, simply supported beam and overhanging beam under point load and uniformly distributed load
10 th	1 st	<ul style="list-style-type: none"> • Shear force and bending moment diagram and its salient features illustration in cantilever beam, simply supported beam and overhanging beam under point load and uniformly distributed load
	2 nd	<ul style="list-style-type: none"> • Shear force and bending moment diagram and its salient features illustration in cantilever beam, simply supported beam and overhanging beam under point load and uniformly distributed load
	3 rd	5. Theory of simple bending <ul style="list-style-type: none"> • Assumptions in the theory of bending,
	4 th	<ul style="list-style-type: none"> • Assumptions in the theory of bending,
11 th	1 st	<ul style="list-style-type: none"> • Bending equation, moment of resistance, section modulus & neutral axis.
	2 nd	<ul style="list-style-type: none"> • Bending equation, moment of resistance, section modulus & neutral axis.
	3 rd	<ul style="list-style-type: none"> • Bending equation, moment of resistance, section modulus & neutral axis.
	4 th	<ul style="list-style-type: none"> • Solve simple problems
12 th	1 st	<ul style="list-style-type: none"> • Solve simple problems
	2 nd	<ul style="list-style-type: none"> • Solve simple problems
	3 rd	<ul style="list-style-type: none"> • Solve simple problems
	4 th	<ul style="list-style-type: none"> • CLASS TEST
	1 st	6. Combined direct & bending stresses <ul style="list-style-type: none"> • Define column
	2 nd	<ul style="list-style-type: none"> • Axial load, eccentric load on column



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13 th	3 rd	<ul style="list-style-type: none"> Direct stresses, bending stresses, maximum & minimum stresses. numerical Problems on above.
	4 th	<ul style="list-style-type: none"> Direct stresses, bending stresses, maximum & minimum stresses. numerical problems on above.
14 th	1 st	<ul style="list-style-type: none"> Buckling load computation using Euler's formula (no derivation) in columns with various end conditions
	2 nd	<ul style="list-style-type: none"> Buckling load computation using Euler's formula (no derivation) in columns with various end conditions
	3 rd	<p>7.Torsion</p> <ul style="list-style-type: none"> Assumption of pure torsion
	4 th	<ul style="list-style-type: none"> The torsion equation for solid and hollow circular shaft
15 th	1 st	<ul style="list-style-type: none"> The torsion equation for solid and hollow circular shaft
	2 nd	<ul style="list-style-type: none"> The torsion equation for solid and hollow circular shaft
	3 rd	<ul style="list-style-type: none"> Comparison between solid and hollow shaft subjected to pure torsion
	4 TH	<ul style="list-style-type: none"> CLASS TEST

RECOMMENDED BOOKS

Sl. No.	Author	Title of the book	Publisher
01	S Ramamrutham	Strength of Materials	Dhanpat Rai
02	R K Rajput	Strength of Materials	S.Chand
03	R.S khurmi	Strength of Materials	S.Chand
04	G H Ryder	Strength of Materials	Mc millon and co.lmtd
05	S Timoshenko and D H Young	Strength of Materials	TMH

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