BIT POLYTECHNIC, BALASORE

3rd SEMESTER MECHANICAL ENGINEERING (W-2025)

SUBJECT- STRENGTH OF MATERIAL

NAME OF FACULTY: JAGAJYOTI SAHU, HOD(MECH.) **TOTAL PERIOD-60**

THEORY-4Periods/WEEK

Semester from :14/07/2025 to 15/11/2025

Sl No.	week	Day	Topics to be covered
1	1st	1st day	Simple stress& strain
		2nd day	Types of load, stresses & strains,(Axial and tangential) Hooke's law, Young's modulus, bulk modulus, modulus of rigidity, Poisson's ratio, derive the relation between three elastic constants
		3rd day	Principle of super position, stresses in composite section.
		4th day	Temperature stress, determine the temperature stress in composite bar (single core)
Sl No.	**week**	**Day**	**Topics to be covered**
2	2nd	1st day	Strain energy and resilience, Stress due to gradually applied, suddenly applied and impact load
		2nd day	Simple problems on above.
		3rd day	Thin cylinder and spherical shell under internal pressure
		4th day	Definition of hoop and longitudinal stress, strain
Sl No.	**week**	**Day**	**Topics to be covered**
3	3rd	1st day	Computation of the change in length, diameter and volume
		2nd day	Determination of normal stress, shear stress and resultant stress on oblique plane
		3rd day	Location of principal plane and computation of principal stress
		4th day	Location of principal plane and computation of principal stress and Maximum shear stress using Mohr's circle
Sl No.	**week**	**Day**	**Topics to be covered**
4	4th	1st day	Types of beam and load
		2nd day	Concepts of Shear force and bending moment
		3rd day	Shear Force and Bending moment diagram and its salient features illustration in cantilever beam, simply supported beam and over hanging beam under point load and uniformly distributed load
		4th day	Numerical on above
Sl No.	**week**	**Day**	**Topics to be covered**
5	5th	1st day	Shear Force and Bending moment diagram and its salient features illustration in cantilever beam, simply supported beam and over hanging beam under point load and uniformly distributed load
		2nd day	Numerical on above

		3rd day	Theory of simple bending
		4th day	Simple problems solving
Sl No.	**week**	**Day**	**Topics to be covered**
6	6th	1st day	Bending equation, Moment of resistance, Section modulus& neutral axis
		2nd day	Combined direct & bending stresses
		3rd day	Define column
		4th day	Axial load, Eccentric load on column,
Sl No.	**week**	**Day**	**Topics to be covered**
7	7th	1st day	Direct stresses, Bending stresses,
		2nd day	Maximum& Minimum stresses
		3rd day	Numerical problems on above
		4th day	Numerical problems on above
Sl No.	**week**	**Day**	**Topics to be covered**
8	8th	1st day	Columns with various end conditions
		2nd day	Columns with various end conditions
		3rd day	Direct stresses, Bending stresses,
		4th day	Numerical problems on above
Sl No.	**week**	**Day**	**Topics to be covered**
9	9th	1st day	Torsion
		2nd day	Assumption of pure torsion
		3rd day	The torsion equation for solid and hollow circular shaft
		4th day	Comparison between solid and hollow shaft subjected to pure torsion
Sl No.	**week**	**Day**	**Topics to be covered**
10	10th	1st day	The torsion equation for solid and hollow circular shaft
		2nd day	Numerical problems on above
		3rd day	Numerical problems on above
		4th day	Numerical problems on above
Sl No.	**week**	**Day**	**Topics to be covered**
11	11th	1st day	Thin cylindrical shells, longitudinal stress and failure analysis
		2nd day	Hoop stress and failure analysis
		3rd day	Stresses derivation on seamless shells
		4th day	Stresses derivation on seam shells

Sl No.	week	Day	Topics to be covered
12	12th	1st day	Numerical problems on safe thickness
		2nd day	Numerical problems on safe working pressure
		3rd day	Numerical problems on safe thickness and working pressure
		4th day	
Sl No.	**week**	**Day**	**Topics to be covered**
13	13th	1st day	Numerical problems on above
		2nd day	Numerical problems on above
		3rd day	Numerical problems on above
		4th day	Numerical problems on above
Sl No.	**week**	**Day**	**Topics to be covered**
14	14th	1st day	Numerical problems on above
		2nd day	Numerical problems on above
		3rd day	Numerical problems on above
		4th day	Numerical problems on above
Sl No.	**week**	**Day**	**Topics to be covered**
15	15th	1st day	Numericals problem solving
		2nd day	Numericals problem solving
		3rd day	Doubt clearance and Revision
		4th day	Doubt clearance and Revision