UTKAL GOURAV MADHUSUDAN INSTITUTE OF TECHNOLOGY, RAYAGADA
Academic Lesson Plan for Winter Semester- 2022

Name of the Teaching Faculty: Er. Amiya Ranjan Patra **DEPARTMENT: Mechanical Engineering**

Semester: 3rd **Subject: STRENGTH OF MATERIAL**

No. of Periods per Week: 4 **Total Periods: 60**

End Semester Exam: 80 **Class Test: 20**

Total Marks: 100 **Theory - 2**

Sl. No.	Week	Period	Topic to be Covered
1.	1st	1st	Types of load, stresses & strains,(Axial and tangential)
2.		2nd	Hooke's law, Young's modulus, bulk modulus, modulus of rigidity,
3.		3rd	Poisson's ratio, derive the relation between three elastic constants.
4.		4th	Principle of super position, stresses in composite section
5.	2nd	1st	Concept Temperature stress
6.		2nd	Determine the temperature stress in composite bar.
7.		3rd	Strain energy and resilience, Stress due to gradually applied,
8.		4th	suddenly applied and impact load
9.	3rd	1st	Solve Simple problems on above.
10.		2nd	Do
11.		3rd	Definition of hoop and longitudinal stress, strain
12.		4th	Derivation of hoop stress, longitudinal stress, hoop strain.
13.	4th	1st	longitudinal strain and volumetric strain.
14.		2nd	Do
15.		3rd	Computation of the change in length, diameter and volume.
16.		4th	Solve simple problems on above.
17.	5th	1st	Do

18.		2nd	Determination of normal stress, shear stress and resultant stress on oblique plane.
19.		3rd	Do
20.		4th	Do
21.		1st	Location of principal plane and computation of principal stress
22.	6th	2nd	Do
23.		3rd	Do
24.		4th	Concept of Mohr's circle
25.		1st	Location of principal plane using Mohr's circle
26.	7th	2nd	Computation of principal stress using Mohr's circle
27.		3rd	Maximum shear stress using Mohr's circle
28.		4th	Types of beam and load
29.		1st	Do
30.	8th	2nd	Concepts of Shear force and bending moment
31.		3rd	Do
32.		4th	Do
33.		1st	Concept Shear Force and Bending moment diagram
34.	9th	2nd	Concept of cantilever beam ,simply supported beam and over hanging beam
35.		3rd	Concept of point load and uniformly distributed load
36.		4th	Determine S.F. and B.M. of the above beams under point load.
37.		1st	Determine S.F. and B.M. of the above beams under udl.
38.	10th	2nd	Assumptions in the theory of bending.
39.		3rd	Bending equation.
40.		4th	Moment of resistance
41.		1st	Concept of Section modulus& neutral axis.
42.	11th	2nd	Do
43.		3rd	Do
44.		4th	Slove simple Problem
45.		1st	Do
46.	12th	2nd	Do
47.		3rd	Do
48.		4th	Define column, Axial load, Eccentric load on column
49.		1st	Direct stresses and Bending stresses, Maximum and Minimum stresses.
50.	13th	2nd	Numerical problems on above.
51.		3rd	Do
52.		4th	Buckling load calculation using Euler's formula in columns with various end condition.
53.	14th	1st	Do

54.		2nd	Concept of pure torsion.
55.		3rd	The torsion equation for solid circular shaft.
56.		4th	The torsion equation for hollow circular shaft.
57.		1st	Do
58.	15th	2nd	Comparison between solid and hollow shaft subjected to pure torsion
59.		3rd	Do
60.		4th	Do

The above lesson plan prepared by the concerned faculty.

Er. Amiya Ranjan Patra

PTGF, MECHANICAL DEPARTMENT