

LESSON PLAN

Name of faculty:-Mr. Amit Kumar Mech. Engg.

Discipline:- Mech 3rd

Sub- SOM

Subject:- Teaching Load:- 3 Lect./Week Practical:- 1 Turn Group/Week
(2 Hrs./Turn)

Lesson Plan duration :- 16 weeks (30-07-2026 To 23-11-2026)

THEORY		
WEEK	LECTURE DAY	Topic
1 st	1	Unit 1 : Stresses and Strains Basics concept of load, stress and strain
	2	Tensile, compressive, shear stresses
	3	Linear, lateral, shear, volumetric strain ,Concept of elasticity, elastic limit,limit of proportionality
2 nd	4	Hook's law, elastic constant, their relation,nominal stress
	5	stress strain curve for ductile and brittle materials
	6	Yield point, plastic stage, ultimate and breaking stress Percentage elongation, proof and working stress
3 rd	7	Factor of safety, poisson's ratio, thermal stress and strain, Introduction to principal stresses
	8	Longitudinal and circumferential stresses,in seamless thin walled cylindrical shells
	9	Unit2: Resilience strain energy, resilience, proof resilience and modulus of resilience
4 th	10	Strain energy due to direct stress and shear stress
	11	Stress due to gradual,sudden and falling load
	12	Unit3: Moment of Inertia Concept of moment of inertia and second moment of area, Radius of gyration
5 th	13	Theorem of perpendicular axis and parallel axis
	14	Second moment of area of rectangle ,triangle, circle and numerical of these
	15	Second moment of area for L,T,I and numerical Section modulus
6 th	16	Numerical problems and revision
	17	Unit4: Bending Moment and Shearing Force Concept to various types of beams and loading
	18	Concept of end supports,hinged and fixed, Concept of bending moment and shear force

7 th	19	B.Mand S.F diagram for cantilever beam
	20	B.M.and S.F diagram for simply supported beam
	21	Sessional Test (Tentative)
8 th	22	B.M and S.F diagram of cantilever and simply supported beams with or without overhang and U.D.L
	23	Unit5: Bending Stresses concepts of bending stresses
	24	Theory of simple bending , Derivation of bending equation
9 th	25	Concept of moment of resistance
	26	Bending stress diagram, section modulus for rectangles
	27	Section modulus for circular and symmetrical I section, Bending stress in beams of rectangular
10 th	28	Bending stress in circular and T section
	29	Numerical and revision
	30	Unit6: Columns Concept of column, modes of failure, Types of columns, modes of failure of column
11 th	31	Buckling load, crushing load, slenderness ratio,Effective length, end restraints
	32	Sessional Test (Tentative)
	33	Factor effecting strength of a column, Strength of column by Euler formula without derivation
12 th	34	Rankine Gourdan formula
	35	Unit7: Torsion concept of torsion, difference between torque and torsion
	36	Derivation of torsion equation, Use of torsion equation for circular shaft (solid and hollow)
13 th	37	Comparison of solid and hollow shaft
	38	Power transmitted by shaft
	39	Concept of mean and maximum torque
14 th	40	Unit8: Springs Closed coil helical springs subjected to axial load
	41	Calculation of stress deformation
	42	Stiffness and angle of twist and strain energy and proof resilience
15 th	43	Numerical problems
	44	Determination of number of plates of laminated springs
	45	Revision Discuss on problems
16 th	46	Numerical problems and revision
	47	Sessional Test (Tentative)
	48	Numerical problems and revision

PRACTICAL EXERCISES		
Week	TURN	EXPERIMENT
1	1	1.Tensile test of mild steel bar
2	2	Revision of practical 1
3	3	2. Bending tests on a steel bar or a wooden bar
4	4	Revision of practical 2
5	5	VIVA VOCE of EX.1 & 2
6	6	3. Impact test on Metals by IZOD test
7	7	Sessional Test
8	8	3. Impact test on Metals by CHARPY test
9	9	4. Torsion test of solid specimen of circular section of different metals for determining modulus of Rigidity.
10	10	Revision of practical 4 and VIVA VOCE
11	11	Sessional Test
12	12	5.To plot a graph between load and extension and to determine the stiffness of a helical spring
13	13	6.Hardness test on different material
14	14	Revision of practical 6 and VIVA VOCE
15	15	Revision of practical 6 on another metal
16	16	Sessional Test