LESSON PLAN

Name of faculty: Vishnu Goyal
Discipline: Mechanical Engineering
Semester: 3rd
Subject: Strength of Material

Lesson Plan Duration: 15 Weeks

Work Load (Lecture/Practical) per week: (3 Lectures & 2 Practicals)

WEEK	LECTURE DAY	THEORY	PRACTICAL
		Topic (Including Assignment/test)	Topic
1st week	1st day	**Unit 1: Stresses and Strains** Basics concept of load, stress and strain	1.Tensile test on mild steel bar
	2nd day	Stress and strain	
	3rd day	Tensile, compressive, shear stress	
2nd week	1st day	Linear and Lateral strain	2.Tensile test on Aluminum bar
	2nd day	Shear strain	
	3rd day	Volumetric strain, Concept of elasticity, Elastic limit, limit of proportionality	
3rd week	1st day	Hooks law	Revision of practical no 1
	2nd day	Elastic constants	
	3rd day	Nominal strain, Stress strain curve for ductile and brittle material	
4th week	1st day	Yield point, plastic stage, ultimate and breakingstress, Percentage elongation, proof and working stress	Revision of practical 2
	2nd day	Factor of safety, Poison's ratio, Thermalstress and strain	
	3rd day	Introduction to principal stresses, Longitudinal and circumferential stresses In seamless thin walled cylindrical shells	

5th week	**1st day**	**Resilience:** Strain energy, resilience, Proof resilienceand modulus of resilience	**3. Bending tests on a steel bar**
	2nd day	Strain energy due to direct stress and shear stress	
	3rdday	Stress due to gradual, sudden and falling load	
6th week	**1st day**	**Doubts Session , ASSIGNMENT - 1**	**4. Bending tests on wooden bar**
	2nd day	**1ST SESSIONAL TEST**	
	3rdday	**Unit 2: Moment of Inertia**: concept of moment of inertia, Theorem of perpendicular and parallel axis	
7th week	**1st day**	Second moment of area of rectangle, triangle, circle and numerical	**5. Impact test on IZOD test**
	2nd day	Second moment of area for L,T,I sections and Section modulus.	
	3rdday	**Unit 3: Bending Moment and Shearing Force** Concept of various types of beams and loading	
8th week	**1st day**	Concept of end supports, hinged and fixed, Concept of bending moment and shear force	**6. Impact test on CHARPY test**
	2nd day	B.M and S.F diagram for cantilever beam, B.M. and S.F diagram for simply supportedbeam	
	3rdday	B.M and S.F diagram of cantilever and simply supported beams with or without overhang and U.D.L	
9th week	**1st day**	**Unit 4: Bending Stresses** Concepts of bending stresses	**7. Torsion test of solid specimen of circular section of different metals for determining modulus of rigidity**
	2nd day	Theory of simple bending, Derivation of bending equation.	

	3rd day	Concept of moment of resistance, Bending stress diagram, section modulus for rectangles	
10th week	**1st day**	Section modulus for circular and symmetrical I-section, Bending stress in beamsof rectangular crossection	**Revision of practical 7**
	2nd day	Bending stress in circular and T section, **ASSIGNMENT- 2**	
	3rd day	**2ND SESSIONAL TEST**	
11th week	**1st day**	**Columns:** Concept of column, modes of failure, Types ofcolumns, modes of failure of column	**8.To plot a graph between load and extension and to determine the stiffness of a helical spring**
	2nd day	Buckling load, crushing load, slenderness ratio, Effective length, end restraints	
	3rd day	Factor effecting strength of a column, Strengthof column by Euler formula without derivation	
12th week	**1st day**	Rankine-Gourdan formula, **Unit 5: Torsion:** Concept of torsion, difference between torque and torsion	**Revision of practical 8**
	2nd day	Derivation of torsion equation, Use of torsionequation for circular shaft (solid and hollow)	
	3rd day	Comparison of solid and hollow shaft	
13th week	**1st day**	Power transmitted by shaft, Concept of mean and maximum torque	**9. Hardness test on different material**
	2nd day	**Springs:** Closed coil helical springs subjected to axial load	
	3rd day	Calculation of stress deformation	
14th week	**1st day**	Stiffness, angle of twist, strain energy, Determination of number of plates of laminated springs	**Revision of practical 9**
	2nd day	Numerical**, ASSIGNMENT - 3**	
	3rd day	**3RD SESSIONAL TEST**	

15th week	**1st day**	Revision	**Revision of practical 9 on another metal**
	2nd day	Revision	
	3rdday	Revision	