LESSON PLAN

FACULTY NAME: BHUPENDER SINGH (Theory) & VIVEK DESWAL (Practical)

DISCIPLINE: MECHANICAL ENGINEERING

SUBJECT: STRENGTH OF MATERIALS (3rd Sem.)

LESSON PLAN DURATION: 15 WEEKS

WORK LOAD (LECTURE/PRACTICAL)/WEEK: (3L, 4P)

WEEK	LECTURE DAY	THEORY	PRACTICAL
		Topic (Including Assignment/test)	Topic
1st week	1st day	Unit 1: Introduction of Stresses and Strains, basics concept of load.	1.Tensile test on bars of Mild steel and Aluminum.
	2nd day	Tensile, compressive, shear stress	
	3rd day	Linear, lateral, shear, volumetric strain Concept of elasticity, elasticlimit, limit of proportionality	
2nd week	1st day	Hooks law, elastic constant, nominal strain	2.Bending test on a steel bar or a wooden beam
	2nd day	stress strain curve for ductile and brittle material	
	3rd day	Yield point, plasticstage,ultimate and breaking stress Percentage elongation, proof and working stress	
3rd week	1st day	Factorofsafety, poison'sratio, thermal stress and strain, introduction to principal stresses	Revision of practical no 1
	2nd day	Longitudinal and circumferential stresses Inseamlessthin walled cylindricalshells	
	3rd day	Unit2: Resilience strain energy, resilience, proof resilience and modulus of resilience	
4th week	1st day	Strain energy due to direct stress and shear stress	Revision of practical 2
	2nd day	Stress due to gradual,sudden andfalling load	
	3rd day	Unit3: Moment of Inertia conceptof moment of inertia	
5th week	1st day	Theorem of perpendicular and parallel axis	Practical 3 (a): Impact test on metals Izod test
	2nd day	Second moment of area of rectangle ,triangle, circleandnumerical of these	
	3rd day	Second moment of area for L,T,I and numerical Section modulus	

6th week	1st day	Numerical problems and revision	Practical 3 (b): Impact test on metals Charpy test
	2nd day	Unit4: Bending Moment and Shearing Fours Concept of various types of beams and loading	
	3rd day	Concept of end supports,hingedand fixed, Concept of bending moment and shear force	
7th week	1st day	B.M and S.Fdiagram for cantilever beam	Practical 4:Torsion test of solid specimen of circular section of different metals for determining modulus of rigidity.
	2nd day	B.M.andS.F diagram for simply supported beam	
	3rd day	B.Mand S.F diagram of cantilever and simply supportedbeams withorwithout overhang and U.D.L	
8th week	1st day	Numerical problems	Revision of practical 3
	2nd day	Unit5: Bending Stresses concepts of bending stresses	
	3rd day	Theoryofsimplebending , Derivation of bending equation	
9th week	1st day	Concept of moment of resistance	Revision of practical 4
	2nd day	Bending stress diagram, section modulus *for rectangles*	
	3rd day	Section modulus for circular and symmetrical Isection, Bendingstressin beams of rectangular	
10th week	1st day	Bendingstressincircular andT section	Practical 5:To plot a graph between load and extension and to determine the stiffness of a helical spring.
	2nd day	Numerical and revision	
	3rd day	Unit6: Columns Concept of column, modes of failure, Types of columns, modes of failure of column	
11th week	1st day	*Buckling load, crushing load, slenderness ratio*	Practical 6:Hardness test on different metals.
	2nd day	*Effective length, end restraints*	
	3rd day	Factor effecting strength of a column, Strength of column by Euler formula without derivation	

12th week	**1st day**	**Rankin gourdan formula**	**Revision of practical 5**
	2nd day	**Unit7: Torsion** **concept of torsion, difference between torque andtorsion**	
	3rd day	**Derivationof torsion equation, Useof torsion equation for circular shaft (solid and hollow)**	
13th week	**1st day**	**Comparison of solid and hollow shaft**	**Revision of practical 6**
	2nd day	**Power transmitted by shaft**	
	3rd day	**Concept of mean and maximum torque**	
14th week	**1st day**	**Unit8: Springs** **Closed coil helical springs subjected to axial load**	**Preparation of viva questions**
	2nd day	**Calculation of stress deformation**	
	3rd day	**Stiffness, angle of twist, strain energy**	
15th week	**1st day**	**Numerical problems**	**Preparation of viva questions**
	2nd day	**Determination of number of plates of laminated springs**	
	3rd day	**Revision and discussion on problems**	