

## LESSON PLAN

Name of faculty: - Guest Faculty  
 Discipline:- Mechanical Engineering  
 Semester:- 3<sup>rd</sup>  
 Subject:- Strength of Material

WEEK	LECTURE DAY	THEORY	PRACTICAL
		Topic (Including Assignment/test)	Topic
1 <sup>st</sup> week	1 <sup>st</sup> day	<b>Unit 1: Stresses and Strains</b> Basics concept of load, stress and strain	1. Tensile test of mild steel bar
	2 <sup>nd</sup> day	Tensile, compressive, shear stress	
	3 <sup>rd</sup> day	Linear, lateral, shear, volumetric strain Concept of elasticity, elastic limit, limit of proportionality	
2 <sup>nd</sup> week	1 <sup>st</sup> day	Hook's law, elastic constant, nominal strain	2. Tensile test of aluminum bar
	2 <sup>nd</sup> day	stress strain curve for ductile and brittle material	
	3 <sup>rd</sup> day	Yield point, plastic stage, ultimate and breaking stress Percentage elongation, proof and working stress	
3 <sup>rd</sup> week	1 <sup>st</sup> day	Factor of safety, Poisson's ratio, thermal stress and strain, introduction to principal stresses	Revision of practical no 1
	2 <sup>nd</sup> day	Longitudinal and circumferential stresses In seamless thin walled cylindrical shells	
	3 <sup>rd</sup> day	<b>Unit 2: Resilience</b> strain energy, resilience, proof resilience and modulus of resilience	
4 <sup>th</sup> week	1 <sup>st</sup> day	Strain energy due to direct stress and shear stress	Revision of practical 2
	2 <sup>nd</sup> day	Stress due to gradual, sudden and falling load	
	3 <sup>rd</sup> day	<b>Unit 3: Moment of Inertia</b> concept of moment of inertia	

5 <sup>th</sup> week	1 <sup>st</sup> day	Theorem of perpendicular and parallel axis	3. Bending tests on a steel bar
	2 <sup>nd</sup> day	Second moment of area of rectangle ,triangle, circle and numerical of these	
	3 <sup>rd</sup> day	Second moment of area for L,T,I and numerical Section modulus	
6 <sup>th</sup> week	1 <sup>st</sup> day	Numerical problems and revision	4. Bending tests on wooden bar
	2 <sup>nd</sup> day	Unit4: Bending Moment and Shearing Force Concept of various types of beams and loading	
	3 <sup>rd</sup> day	Concept of end supports, hinged and fixed, Concept of bending moment and shear force	
7 <sup>th</sup> week	1 <sup>st</sup> day	B.M and S.F diagram for cantilever beam	5. Impact test on IZOD test
	2 <sup>nd</sup> day	B.M. and S.F diagram for simply supported beam	
	3 <sup>rd</sup> day	B.M and S.F diagram of cantilever and simply supported beams with or without overhang and U.D.L	
8 <sup>th</sup> week	1 <sup>st</sup> day	Numerical problems	6. Impact test on CHARPY test
	2 <sup>nd</sup> day	Unit5: Bending Stresses concepts of bending stresses	
	3 <sup>rd</sup> day	Theory of simple bending , Derivation of bending equation	
9 <sup>th</sup> week	1 <sup>st</sup> day	Concept of moment of resistance	7. Torsion test of solid specimen of circular section of different metals for determining modulus of rigidity
	2 <sup>nd</sup> day	Bending stress diagram, section modulus <i>for rectangles</i>	

	3 <sup>rd</sup> day	Section modulus for circular and symmetrical I section, Bending stress in beams of rectangular	
10 <sup>th</sup> week	1 <sup>st</sup> day	Bending stress in circular and T section	Revision of practical 7
	2 <sup>nd</sup> day	Numerical and revision	
	3 <sup>rd</sup> day	Unit 6: Columns Concept of column, modes of failure, Types of columns, modes of failure of column	
11 <sup>th</sup> week	1 <sup>st</sup> day	<i>Buckling load, crushing load, slenderness ratio</i>	8. To plot a graph between load and extension and to determine the stiffness of a helical spring
	2 <sup>nd</sup> day	<i>Effective length, end restraints</i>	
	3 <sup>rd</sup> day	Factor effecting strength of a column, Strength of column by Euler formula without derivation	
12 <sup>th</sup> week	1 <sup>st</sup> day	Rankin gourdán formula	Revision of practical 8
	2 <sup>nd</sup> day	Unit 7: Torsion concept of torsion, difference between torque and torsion	
	3 <sup>rd</sup> day	Derivation of torsion equation, Use of torsion equation for circular shaft (solid and hollow)	
13 <sup>th</sup> week	1 <sup>st</sup> day	Comparison of solid and hollow shaft	9. hardness test on different material
	2 <sup>nd</sup> day	Power transmitted by shaft	
	3 <sup>rd</sup> day	Concept of mean and maximum torque	
14 <sup>th</sup> week	1 <sup>st</sup> day	Unit 8: Springs Closed coil helical springs subjected to <i>axial load</i>	Revision of practical 9
	2 <sup>nd</sup> day	Calculation of stress deformation	
	3 <sup>rd</sup> day	Stiffness, angle of twist, strain energy	

<b>15<sup>th</sup> week</b>	<b>1<sup>st</sup> day</b>	<b>Numerical problems</b>	<b>Revision of practical 9 on another metal</b>
	<b>2<sup>nd</sup> day</b>	<b>Determination of number of plates of laminated springs</b>	
	<b>3<sup>rd</sup> day</b>	<b>Revision Discuss on problems</b>	
<b>16<sup>th</sup> week</b>	<b>1<sup>st</sup> day</b>	<b>Numerical problems</b>	<b>Viva question</b>
	<b>2<sup>nd</sup> day</b>	<b>Numerical problems</b>	
	<b>3<sup>rd</sup> day</b>	<b>Numerical problems</b>	
<b>17<sup>th</sup> week</b>	<b>1<sup>st</sup> day</b>	<b>Revision</b>	<b>Viva question</b>
	<b>2<sup>nd</sup> day</b>	<b>Revision</b>	
	<b>3<sup>rd</sup> day</b>	<b>Revision</b>	