

## LESSON PLAN

**Name of the Faculty :** Gaurav Raghav

**Discipline** Mechanical engineering

**Semester** 4th

**Subject** Machine design and drawing

**Lesson Plan duration :** 15 weeks (from January , 2018 to April , 2018)

Work load (Lecture/ Practical) per week (in hours) : Lecture -02 practical-06

WEEK	THEORY		PRACTICAL	
	Lecture day	Topic (including assignment and test)	Practical Day	Topic
1	1	1.1 Design – Definition, Type of design, necessity of design	1	1.1 Design – Definition, Type of design, necessity of design
	2	1.1.1 Comparison of designed and undesigned work	2	1.1.1 Comparison of designed and undesigned work
2	3	1.1.2 Design procedure	3	1.1.2 Design procedure
	4	1.1.3 Characteristics of a good designer	4	1.1.3 Characteristics of a good designer
3	5	1.2 Design terminology: stress, strain, factor of safety, factors affecting factor	5	1.2 Design terminology: stress, strain, factor of safety, factors affecting factor
	6	of safety, stress concentration, methods to reduce stress concentration,	6	of safety, stress concentration, methods to reduce stress concentration,
4	7	fatigue, endurance limit. 1.2.1 General design consideration	7	fatigue, endurance limit. 1.2.1 General design consideration
	8	1.2.2. Codes and Standards (BIS standards)	8	1.2.2. Codes and Standards (BIS standards)
5	9	1.3 Engineering materials and their mechanical properties :	9	1.3 Engineering materials and their mechanical properties :
	10	1.3.1 Properties of engineering materials: elasticity, plasticity, malleability,	10	1.3.1 Properties of engineering materials: elasticity, plasticity, malleability,
6	11	tenacity, strength ductility, toughness, hardness and resilience. Fatigue, creep	11	tenacity, strength ductility, toughness, hardness and resilience. Fatigue, creep
	12	1.3.2 Selection of materials, criterion of material selection	12	1.3.2 Selection of materials, criterion of material selection
7	13	2.1 Various design failures-maximum stress theory, maximum strain theory,	13	2.1 Various design failures-maximum stress theory, maximum strain theory,
	14	maximum strain energy theory	14	maximum strain energy theory
8	15	2.2 Classification of loads	15	2.2 Classification of loads
	16	2.3 Design under tensile, compressive and torsional loads.	16	2.3 Design under tensile, compressive and torsional loads.
9	17	3.1 Type of shaft, shaft materials, Type of loading on shaft, standard sizes of	17	3.1 Type of shaft, shaft materials, Type of loading on shaft, standard sizes of
	18	shaft available	18	shaft available
10	19	3.2 Shaft subjected to torsion only, determination of shaft diameter (hollow and	19	3.2 Shaft subjected to torsion only, determination of shaft diameter (hollow and
	20	solid shaft) on the basis of :	20	solid shaft) on the basis of :
11	21	3.3 Determination of shaft dia (hollow and solid shaft) subjected to bending	21	3.3 Determination of shaft dia (hollow and solid shaft) subjected to bending
	22	3.4 Determination of shaft dia (hollow and solid shaft) subjected to combined torsion and bending .	22	3.4 Determination of shaft dia (hollow and solid shaft) subjected to combined torsion and bending .

12	23	4.1 Types of key, materials of key, functions of key	23	4.1 Types of key, materials of key, functions of key
	24	4.2 Failure of key (by Shearing and Crushing).	24	4.2 Failure of key (by Shearing and Crushing).
13	25	4.3 Design of key (Determination of key dimension)	25	4.3 Design of key (Determination of key dimension)
	26	4.4 Effect of keyway on shaft strength. (Figures and problems).	26	4.4 Effect of keyway on shaft strength. (Figures and problems).
14	27	5.1 Introduction, Advantages and Disadvantages of screw joints, location of	27	5.1 Introduction, Advantages and Disadvantages of screw joints, location of
	28	5.3 Initial stresses due to screw up forces, stresses due to combined forces	28	5.3 Initial stresses due to screw up forces, stresses due to combined forces
15	29	5.4 Design of power screws (Press, screw jack, screw clamp)	29	5.4 Design of power screws (Press, screw jack, screw clamp)
	30	Types of cams and followers (theoretical)	30	Types of cams and followers (theoretical)