

# LESSON PLAN

DEPARTMENT OF MECHANICAL ENGINEERING, ITT, CHOUDWAR

SUBJECT: TH-2 DESIGN OF MACHINE ELEMENTS Periods:4 per week SEMESTER: 5th

NAME OF FACULTY: GURU PRASAD SAHOO, LECTURER(MECH)

No. of weeks: 15

Week	Class Day	Theory / Practical Topics
1st	1 <sup>st</sup>	Introduction to Machine Design and Classify it.
	2 <sup>nd</sup>	Different mechanical engineering materials used in design with their uses and their mechanical and physical properties.
2 <sup>nd</sup>	1 <sup>st</sup>	Define working stress, yield stress, ultimate stress & factor of safety and stress –strain curve for M.S & C.I.
	2 <sup>nd</sup>	Modes of Failure (By elastic deflection, general yielding & fracture)
3 <sup>rd</sup>	1 <sup>st</sup>	State the factors governing the design of machine elements. Describe design procedure.
	2 <sup>nd</sup>	Design of fastening elements: - Joints and their classification.
4 <sup>th</sup>	1 <sup>st</sup>	State types of welded joints . State advantages of welded joints over other joints.
	2 <sup>nd</sup>	Design of welded joints for eccentric loads. State types of riveted joints and types of rivets.
5 <sup>th</sup>	1 <sup>st</sup>	Describe failure of riveted joints. Determine strength & efficiency of riveted joints
	2 <sup>nd</sup>	Design riveted joints for pressure vessel. Solve numerical on Welded Joint and Riveted Joints.
6 <sup>th</sup>	1 <sup>st</sup>	Design of shafts and Keys: State function of shafts.
	2 <sup>nd</sup>	Design solid & hollow shafts to transmit a given power at given rpm based on a) Strength: (i) Shear stress, (ii) Combined bending tension; b) Rigidity: (i) Angle of twist, (ii) Deflection, (iii) Modulus of rigidity
7 <sup>th</sup>	1 <sup>st</sup>	State standard size of shaft as per I.S. State function of keys, types of keys & material of keys. Describe failure of key, effect of key way
	2 <sup>nd</sup>	Design rectangular sunk key considering its failure against shear & crushing. Design rectangular sunk key by using empirical relation for given diameter of shaft
8 <sup>th</sup>	1 <sup>st</sup>	State specification of parallel key, gib-head key, taper key as per I.S. Solve numerical on Design of Shaft and keys
	2 <sup>nd</sup>	Design of Coupling:Design of Shaft Coupling
9 <sup>th</sup>	1 <sup>st</sup>	Requirements of a good shaft coupling
	2 <sup>nd</sup>	Types of Coupling.
10 <sup>th</sup>	1 <sup>st</sup>	Design of Sleeve or Muff-Coupling
	2 <sup>nd</sup>	Design of Clamp or Compression Coupling
12 <sup>th</sup>	1 <sup>st</sup>	Solve simple numerical on above
	2 <sup>nd</sup>	Design a closed coil helical spring: Materials used for helical spring.
13 <sup>th</sup>	1 <sup>st</sup>	Terms used in compression spring. Stress in helical spring of a circular wire.
	2 <sup>nd</sup>	Deflection of helical spring of circular wire
14 <sup>th</sup>	1 <sup>st</sup>	Surge in spring.
	2 <sup>nd</sup>	Solve numerical on design of closed coil helical compression spring.
15 <sup>th</sup>	1 <sup>st</sup>	Revision
	2 <sup>nd</sup>	Revision

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