

Badriprasad Institute of Technology, Sambalpur

Lesson plan for Theory -5, Design of Machine Elements

Semester & Branch: 5th Sem. Mechanical Engineering

Name of the Faculty: Mr. Pravin Kumar Pathak

Total Periods- 60

No of periods /week- 4

Week	Day	Topic
1	1	Introduction to Machine Design and Classification
	2	Different mechanical engineering materials used in design
	3	Uses of Materials and their mechanical and physical properties
	4	working stress, yield stress, ultimate stress...continue
2	1	factor of safety and stress –strain curve for M.S
	2	Stress –strain curve for C.I.
	3	Elastic deflection, general yielding...continue
	4	General yielding & fracture
3	1	Machine elements
	2	Factors of governing the design of machine elements
	3	Design procedure.
	4	Revision
4	1	Design of fastening elements, Joints
	2	Classification of joints
	3	Welded joints and their types
	4	Advantages of welded joints
5	1	Design of welded joints for eccentric loads
	2	Riveted joint and its types
	3	Types of rivets.
	4	Failure of riveted joints.
6	1	Strength & efficiency of riveted joints
	2	Design of riveted joints for pressure vessel
	3	Numerical on Welded Joint
	4	Numerical on Riveted Joints.
7	1	Design of shafts and Keys
	2	Function of shafts
	3	Materials for shafts
	4	Design solid & hollow shafts to transmit a given power at given rpm based on Strength: (i) Shear stress, (ii) Combined bending tension
8	1	Design solid & hollow shafts to transmit a given power at given rpm based on Rigidity: (i) Angle of twist, (ii) Deflection, (iii) Modulus of rigidity...continue
	2	Modulus of rigidity, size of shaft as per I.S.
	3	function of keys, types of keys...continue
	4	Material of keys, failure of key
9	1	Design of rectangular sunk key considering its failure against shear & crushing

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	2	Design of rectangular sunk key by using empirical relation for given diameter of shaft.
	3	specification of parallel key, gib-head key, taper key as per I.S.
	4	numerical on Design of Shaft and keys.
10	1	Coupling, Types of Coupling.
	2	Shaft Coupling
	3	Requirements of a good shaft coupling
	4	Numerical
11	1	Sleeve or Muff-Coupling.
	2	Design of Sleeve or Muff-Coupling.
	3	Numerical
	4	Clamp or Compression Coupling.
12	1	Design of Clamp or Compression Coupling.
	2	Numerical
	3	Revision
	4	Class test
13	1	Closed coil helical spring
	2	Materials used for helical spring
	3	Standard size spring wire. (SWG)
	4	Terms used in compression spring...continue
14	1	Terms used in compression spring, Stress in helical spring of a circular wire...continue
	2	Stress in helical spring of a circular wire.
	3	Deflection of helical spring of circular wire...continue
	4	Deflection of helical spring of circular wire
15	1	Surge in spring.
	2	Numerical
	3	Doubt Class
	4	Revision

Sign of Faculty

Sign of HOD