

Discipline: <u>Mechanical</u>		Semester: <u>5th</u>	Name of the Teaching Faculty: <u>Tapas Kumar Panda</u>	
Subject: <u>Design of Machine elements</u>		No of Days/Week Class Allotted: <u>1</u>	Semester From date: <u>01.10.21</u> To date <u>18.01.22</u>	No. of Weeks: <u>15</u>
WEEK	Class Day	Theory Topics		
1st	1st	Introduction of machine design and its classification		
	2nd	state load and its types		
	3rd	Define working stress, yield stress, ultimate stress and factor of safety.		
	4th	state mechanical properties of material		
	5th			
2nd	1st	continuing properties of materials.		
	2nd	state the factors governing the design of machine element.		
	3rd	describe the design procedure		
	4th	1st class test of chapter-1 & doubt clearing class		
	5th			
3rd	1st	state nomenclature form of threads & its specification.		
	2nd	Design of screw thread (Nut and Bolt)		
	3rd	continuing, the design of screw thread		
	4th	state types of welded joints.		
	5th			

WEEK	Class Day	Theory Topics
4th	1st	state advantages of welded joints for eccentric load.
	2nd	determine strength of welded joints for concentric load
	3rd	state types of riveted joints
	4th	Explain types of riveted joints.
	5th	
5th	1st	Describe failure of riveted joints.
	2nd	continuing failure of riveted joints
	3rd	determine strength & efficiency of riveted joints & design riveted joints pr. vessel.
	4th	problem solve on screw thread
	5th	
6th	1st	problem solve on welded joints
	2nd	problem solve on riveted joints
	3rd	state function of shaft and materials used for shaft.
	4th	Design solid & hollow shaft to transmit given power at given rpm based on (i) strength (ii) combined stresses
	5th	

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Subject: <u>Design of Machine Elements</u>		No of Days/Week Class Allotted: <u>4</u>	Semester From date: <u>01.10.21</u> To date: <u>18.01.22</u>	No. of Weeks: <u>15</u>
WEEK	Class Day	Theory Topics		
7th	1st	Design of solid and hollow shaft - (iv) modulus of rigidity (v) Rigidity (vi) Angle of twist (vii) Deflection.		
	2nd	State standard size of shaft as per IS Function of keys.		
	3rd	Explain types of keys and material of keys.		
	4th	Design failure of key effect of key way		
	5th			
8th	1st	Design rectangular sunk key considering its failure against shear and crushing.		
	2nd	Continuing design rectangular sunk key		
	3rd	Design rectangular sunk key by using empirical relation for given dia of shaft		
	4th	State specification of parallel key, wood key, taper key as per IS		
	5th			
9th	1st	problems solve in design of shaft		
	2nd	problems solve on design of keys		
	3rd	state types of belt drive		
	4th	State types of pulleys.		
	5th			



WEEK	Class Day	Theory Topics
10th	1st	State formula for length of open belt drive.
	2nd	State formula for crossed belt drive.
	3rd	Centrifugal tension.
	4th	Relation between centrifugal tension and tension on tight and slack side of power transmission.
	5th	
11th	1st	Determine the thickness of the belt.
	2nd	Determine the thickness and width for given permissible stress for open and crossed belt.
	3rd	Continuing thickness of width for given permissible stress for open and crossed belt.
	4th	Design of a cast iron pulley using empirical formula only.
	5th	
12th	1st	Continuing design of cast iron pulley using empirical formula only.
	2nd	Problem solve on belt drive.
	3rd	Problem solve on pulleys.
	4th	Class test - II, on belt drive & pulley.
	5th	

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WEEK	Class Day	Theory Topics
10th	1st	Introduction of helical spring, and material used for helical spring.
	2nd	Standard size of spring wire
	3rd	Terms are used in compression spring
	4th	Stress in helical spring of a circular wire
	5th	
11th	1st	Stress in helical spring of a circular wire
	2nd	End connection for helical tension spring
	3rd	Continuing end connection for helical tension spring
	4th	Deflection of helical spring of circular wire
	5th	
15th	1st	Eccentric loading of spring
	2nd	Surge on spring solve problems.
	3rd	Problems solve on design of spring
	4th	class test - III, Design of spring.
	5th	