

Samrat Ashok Technological Institute, Vidisha

Department of Mechanical Engineering

Lecture Plan

Course Code:	ME-1872 (A)	Year/Semester :	BE 4 th Year/ 7 th Semester
Course Name:	Machine Design II	Academic Year :	August-2023 / ODD
L – T– P :	3 – 1 – 0	Credit :	4
Course Detail :	Theory and Practical	Term Start Date :	24-07-2023
Course Coordinator:	Prof. Nikhil Mohan Vyas	Term End Date :	

Academic Year: 2023					
Name of Teacher: Nikhil Mohan Vyas					
Subject: Machine Design II					
Theory/Tutorial: Theory lectures					
Sr. No.	Name Of Unit/Topics	Hrs. Allotted	Actual Date	Teaching Aid Code	Remarks
01	Unit: 1- Design of belt, rope and chain drives				
	Mechanical drives and power transmission, Advantages & Disadvantages of flexible drives over positive drive, Classification of belt & belt drives, Firkbank's theory of belt drive	1			
	Elastic creep in belt drive, Velocity ratio, Slip in belt drive and its effect on V.R	1			
	Geometrical relationships, belt tensions, and power transmission	1			
	Belt construction and selection of flat belt from manufacturers catalogue	1			
	Design of pulleys for flat belt	1			
	Selection of V-belt from manufacturers catalogue	1			
	Selection of V-grooved pulley	1			
	Basics of chain drive and construction of chain	1			
	Polygonal effect and power rating of roller chain, failure criteria	1			
	Design of chain drive	1			
02	Unit: 2- Design of gears				
	Gear terminology and Gear tooth failure modes	1			
	Beam strength of gear tooth and design of gear against bending failure: Lewis Equation	1			
	Velocity factor method and Buckingham equation to account for dynamic effects in gear design.	1			
	Design of gear against wear strength,	1			

	Contact stresses and Buckingham equation of gear design to account for surface wear	1			
03	Unit: 3- Design of I.C. Engine components				
	Cylinder block and cylinder liners, Selection of materials for cylinder block and cylinder liners,	1			
	Design of engine cylinder, cylinder head and studs for cylinder.	1			
	Design of piston head, piston ribs, rings, barrel, piston skirt, and piston pin.	1			
	Design of connecting rod	1			
	Design of crankshaft	1			
04	Unit:4- Design of miscellaneous components				
	Introduction to couplings, Difference between rigid and flexible coupling	1			
	Sleeve or muff coupling, Design of muff coupling	1			
	Design of clamp coupling.	1			
	Design of rigid coupling, Design of thin cylinders and pressure vessels	1			
	Design of thick cylinders, Autofrettage.	1			
05	Unit5- Optimization				
	Basics of optimization, adequate and optimum design and classification of optimization techniques	1			
	Applications of optimization in engineering	1			
	Optimization problem formulation and classification of optimization problem	1			
Teaching Aid Code:		Sign of Teacher: _____			
1	White board				
2	L.C.D/overhead PROJECTOR				
3	MODEL&CHART				
4	PPT&VIDEO				
Note: Every week there is a tutorial class for practice of design problems/numericals.					

Reference Books:

- Bhandari VB, "Design of machine elements" ,TMH
- Shigley JE, "Machine Design", TMH
- Juvinall RC, Marshek KM, "Fundamentals of machine component design", Wiley
- Collins JA, Busby HR, Stabb GH, "Mechanical Design of machine elements and machines- A failure prevention perspective" Wiley