

Devi Ahilya University, Indore, India Institute of Engineering & Technology				III Year B.E. (Mechanical Engg.) (Full Time)			
Subject Code & Name	Instructions Hours per Week			Credits			
6MERC1 MACHINE DESIGN - II	L	T	P	L	T	P	Total
	3	1	0	3	1	0	4
Duration of Theory Paper: 4 Hours							

Course Objective:

The course is designed

1. To provide the knowledge of fundamentals of designing the Mechanical Components.
2. To introduce the designing of Internal Engine Components.
3. To develop skill to analyze the component under dynamic loading.
4. To introduce the importance of seals & gasket in Engine.

Pre requisite(s): Machine Design I, Material Science, Strength of Material.

COURSE CONTENTS

UNIT-I

Design of Power Transmission Elements: Design for single plate clutch, cone clutch, centrifugal clutch, flat belt, V belt, power screw, spur gear, helical gear and Bevel gear.

UNIT-II

Design for Dynamic Loading: Stress concentration factor, design of parts subjected to Fatigue loading.

UNIT -III

Design for Brakes: Design of shoe brakes, band brakes, block brakes, internal expanding brakes and disc brakes.

UNIT-IV

Design for Internal Combustion Engine Parts: Design for Engine cylinder, piston, connecting rod.

UNIT-V

Design of Crank Shaft , Concept of Seals and Gasket:

Design of crank shaft, valves and valve gear mechanism Brief Introduction about seals and gasket.

Note: Only Mechanical Engineer’s Handbook, Data-books and certified notes are allowed in the examination hall.

Course Outcome:

Students earned credits will develop ability to

- CO1. Design the various components of Internal Combustion Engine.
- CO2. Design the components under Dynamic Loading.
- CO3. Understand the applications of seals & gaskets.
- CO4. The different types of failure mode in mechanical components.

BOOKS RECOMMEDED:

- [1]. Shigley J.E., *Mechanical Engineering Design*, McGraw-Hill 2015.
- [2]. Spotts M.F., Shoup T.E., Hrnberger L.E., *Design of Machine Elements*, Pearson Education ,8e,2007.
- [3]. Sharma P.C. & Aggarwal D.K., *Machine Design*, S.K.Kataria & Sons,11e,2013
- [4]. Bhandari V.B., *Design of Machine Elements*, McGraw-Hill, 4e,2017.
- [5]. Black and Adams, *Machine Design*, Mc.Graw Hill,1968
- [6]. Maleev V.L., *I.C.Engine Design*, , Mc.Graw Hill ,1945

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Course Outcome:

Students earned credits will develop ability to

CO.No.	CO	PO
CO1	Design the various components of Internal Combustion Engine.	PO1, PO3, PO5, PO7
CO2	Design the components under Dynamic Loading.	PO1, PO2, PO4, PO12
CO3	Understand the applications of seals & gaskets.	PO1, PO2
CO4	The different types of failure mode in mechanical components.	PO1, PO2, PO4

CO-PO Relationship

CO	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12
CO1	3		3		3		2					
CO2	3	3		3								2
CO3	3	3										
CO4	3	3		3								
CO5												

* CO (rows) mention nil/very small/insignificant contribution to the PO(column)
 1 → relevant and small significance 2 → medium or moderate and 3 → strong