AE405: Design of Automobile Components										
L	**T**	**P**	Credit	Area		**CWS**	**PRS**	**MTE**	**ETE**	**PRE**
3	0/1	2/0	4	DEC		15/25	25/-	20/25	40/50	-

Objectives: To familiarize the students with the process of design and analysis of engineering systems and to enhance critical thinking and prepare him for facing design challenges. To familiarize him with statistical, decision making and optimization tools

AE405: Design of Automobile Components		Contact Hours
Unit-1	**Design of friction clutches:** common friction materials, single plate, multi plate and centrifugal clutches and their characteristics and design of friction clutches	**8**
Unit-2	**Mechanical gears:** Design of Helical, Bevel and Worm Gears, Belt and Chain drives and Automotive Gear box assembly. Brakes: Common friction materials, shoe, band, cone and disc brakes their characteristics and design of brake assembly	**6**
Unit-3	**Design of Bearings:** Rolling contact bearing: types of rolling contact bearings, static and dynamic load capacities, Stribeck's equation, equivalent bearing load, load life relationship, bearing life, load factor, selection of bearings from manufacturers catalogue. Lubrication and mountings, dismounting and preloading of bearings, oil seals and packing	**6**
Unit-4	**Sliding contact bearings:** bearing material and their properties, bearing types, and their constructional details, hydrodynamic lubrication- basic theory, design consideration in hydrodynamic bearings, Raimondi and Boyd method relating bearing variables	**8**
Unit-5	Design of Engine Parts: Piston, Engine Valves, Cylinder, Connecting Rod, Crank Shaft for CI and SI engines.	**8**
Unit-6	**Introduction to the design of automobile chassis**: Aerodynamic formulations, Calculation of various aerodynamic resistance	**6**
	Total	**42**

Reference Books:	
1	Maleeve Hartman and O.P. Grover, "Machine Design", CBS Publication & Publishers, ISBN-13: 978-8123906379
2	V.B Bhandari, "Machine Design", Tata Mcgraw Hill, ISBN 0070681791, 9780070681798
3	P.C. Sharma and D.K Aggarwal., "Machine Design", S.K. Kataria& Sons, ISBN 8185749094, 9788185749099

Course Outcomes

CO1	To study design of friction clutches and their characteristics.
CO2	To study mechanical gear, brakes and their characteristics.
CO3	To study design of bearing and its static and dynamic load capacities.
CO4	To study bearing and hydrodynamic lubrication
CO5	To study of design of engine components of SI and CI engine.
CO6	To study of design of Automobile chassis.

CO-PO/PSOMatrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	2	2	0	0	0	0	0	0	2	2	1	1
CO2	3	3	2	3	1	0	0	0	0	0	0	1	2	1	1
CO3	3	3	3	3	1	0	0	0	0	0	0	2	3	3	2
CO4	3	3	3	3	1	0	0	0	0	0	0	1	3	3	2
CO5	2	2	2	2	2	0	0	0	0	0	0	1	2	2	2