4067 - DESIGN & DRAWING OF AUTO COMPONENTS										
Teaching Schedule Per Week			Progressive Assessment		Examination Schedule (Marks)					
					Theory		Practical Ex.		Total	
Lectures	Practical	Credits								
3	2	6	25	25	4 Hrs.	100	-		150	
Pre-requisite		Source			Theory	Test	Total	TW	PR	Gr Total
4032			Semester		75	25	100	25	–	125

Rationale: - The learning of this subject deals on the basic concepts of design of some of the components used in an automobile. Although modern method of designing every component are far advanced, nevertheless the fundamentals involved in each of these are all the same. Bearing in mind these facts, the learning of these facts, the learning of these subject will brief the student on the analysis of possible modes of failure of the components, selection of these materials, their properties, shapes sizes and sections.

COURSE CONTENTS	Hrs	Mks
1. BASIC PRINCIPLES OF DESIGN Stress, strain elastic limit, yield strength, alternate strength, stress-strain diagram, Hook' law, Factor of safety, general consideration in selecting factor of safety, General consideration for selection of materials and manufacturing processes, General design consideration and procedure, Allowance, tolerances, and fits; types of fits, Introduction to the use of design data book.	6	10
2. COMBINED STRESSES & APPLICATIONS Combined Bending moment, Twisting Moment and Axial load, Combined Normal and Shear stress, Applications of the above, like:- C-Clamp frame, propeller shaft, Main bearing journal having overhanging crankpin, Line shaft supported in two bearings with pulley mounted in-between	8	16

3. SCREWED FASTENERS Types of fasteners, Bolts of uniform strength, Eccentric loading of bolts.	6	12
4. KEYS & COUPLINGS Types of keys, their uses, Design analysis of sunk key, Design of flanged coupling & Bush pin type flexible coupling, Design of pin and shaft diameters of Universal coupling.	7	16
5. SPRINGS Classification, application and functions of springs. Materials used, Close coiled helical springs of round wire:- a) Their nomenclature b) their spring rate, spring index, end connections for compression springs, Stresses, Wahl'stress factors, deflection, Design of leaf springs: stress, deflection, and number & size of leaves, nip for equalised stress in leaves.	9	16
6. I.C. ENGINE COMPONENTS Buckling of structs & columns, Application of Euler's and Rankine formulae. Design of a) Connecting rod (shank, small end and big end bearing and bolts) b) Push rods. Design of Crown :- a) Trunk type piston b) Piston pin c) Single plate and multi-plate friction clutch.	12	30
Total	48	100

TERM WORK:

Five working drawing sheets to be submitted along with design calculations, including two major components

REFERENCE BOOKS:

1. Machine Design by R.S. Khurmi
2. Machine Design by Pandya & Shah
3. Machine Design by S.G. Kulkarni
4. Machine Design by R.K. Jain
5. Machine Design by D.C. Sharma & D.K. Aggarwal
6. Elements of Motor Vehicle Design by Donkin
7. Automobile Design Problems by K.M. Aggarwal.