Gautam Buddha University; Greater Noida

School of Engineering (Mechanical Engineering)

Degree	Course Name	Course Code	Marks:100
M. Tech. in Design Engg.	Design of Automotive Components	MED 513	SM+MT+ET 25+25+50
Semester	**Credits**	**L-T-P**	**Exam.**
I	3	3-0-0	3 Hours

Unit I

Introduction: Engineering materials and their physical properties applied to design; Selection of materials; Factor of safety; Endurance limit; Notch sensitivity; Principles of design optimization; Future trends; Computer aided drafting. **(07 Hours)**

Unit II

Limits; Fits; Tolerances; Surface Finish; Shafts And Spring: Definitions; Types of tolerances and fits; Design considerations for interference fits; Surface finish; Surface roughness; Design of power transmission shafts; Design of helical springs **(08 Hours)**

Unit III

Design Of Cylinder And Piston: Choice of material for cylinder and piston; Piston friction; Piston slap; Design of cylinder; Piston; Piston pin; piston rings; Piston failures; Lubrication of piston assembly. **(07 Hours)**

Unit IV

Design Of Connecting Rod; Crankshaft: Material for connecting rod; Determining minimum length of connecting rod; Small end and big end design; Shank design; design of big end cap bolts; Connecting rod failures; Balancing of I.C. Engines; Significance of firing order; Material for crankshaft; Design of crank shaft under bending and twisting; Balancing weight calculations. **(08 Hours)**

Unit V

Design of Valves and Flywheel: Design aspects of intake and exhaust manifolds; Inlet and Exhaust valves; Valve springs; Tappets; Valve train. Materials and design of flywheel. **(08 Hours)**

Unit VI

Practical Aspects: Performance Comparison of Advanced Vehicles based a on diesels and petrol fuels. Environmental issues and their impact on design of engines. **(07 Hours)**

Recommended Books:

1. Machine Design; R.K. Jai; Khanna Publishers; New Delhi; 1997.
2. Design Data Book; PSG College of Technology; Coimbatore; 2000.
3. High Speed Combustion Engines; P.M.Heldt; Oxford-IBH Publishing Co.; Calcutta; 1965.
4. Design of Automotive Engines; A. Kolchin and V. Demidov; MIR Publishers; Moscow; 1984.
5. Machine Design; T. V. Sundararaja Murthy; Khanna Publishers; New Delhi; 1991.