

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E Semester: 2

Mechanical Engineering (I.C.Engine & Automobile)

Subject Name Modern Vehicle Design

Sr.No	Course content
1.	Engine Components; Material, construction and design aspects of engine components; Determination of engine power; Engine selection-swept volume, stroke, bore & no. of cylinders; Arrangement of cylinders stroke to bore ratio.
2.	Design procedure and considerations, material selection & actual design of components; cylinder block design; Design of Piston; piston assembly; Cylinder, Cylinder liner, Cylinder head, Combustion Chamber, Connecting rod, Crank Shaft, Fly Wheel, valves, valve actuating mechanism, cams, camshaft drives, vibration damper, Gearbox design, Constant-mesh gearboxes, synchro-mesh gearboxes, heavy vehicle gearboxes.
3.	Design of couplings; design fluid couplings; torque converter; differential axle; Suspension system design; Tandem axle suspension; adaptive suspension system; shock dampers; Steering system design – power assisted steering, four wheel steering system.
4.	Design of Brakes – Hydraulic brakes, air and endurance brake, antilock brakes; vehicle structure; chassis frames; Principle of vehicle Aerodynamics; Aerodynamic design of vehicle, latest developments.
5.	Introduction to CAD; The product cycle and CAD; Automation and CAD; Finite element analysis; Stress analysis on Automobile Components.

Reference Books:

1. The Automotive Chassis – Engineering Principle – Reimpell J.
2. Automotive Chassis – Design & Calculation – P. Lukin, G. Gasparyarts, V. Rodionov, MIRPublishing, Moskow
3. Automotive Chassis – P. M. Heldt, Chilton Co. NK
4. Mechanics for Road Vehicles – W. Steed, Illiffe Books Ltd., London
5. Design of Automotive engines, Kolchin and Demodov
6. Automotive design, Jiles. J.G
7. Machine Design, Pandya and Shah
8. Machine Design, Khurmi and Gupta