Course Type	Course Code	Name of Course	L	T	P	Credit
OE	MMO301	AUTOMOBILE ENGINEERING	3	0	0	9

Course Objective

Students will learn about different subsystems of an automobile such as power unit, chassis and suspension, transmission system, steering system, breaking system and electrical system. They will also learn about maintenance and troubleshooting of an automobile.

Learning Outcomes

Upon successful completion of this course, the students will

- understand the general layout and type of automotive vehicles and power unit,position of power unit, power requirements, motion resistance and power loss, tractive effort and vehicle performance curves.
- get the knowledge regarding selection of power unit, engine performance characteristics, pollution due to vehicle emission and exhaust emission control system, loads on the frame, considerations of strength, different types of chassis and their construction, engine mounting on the chassis, need of suspension system, types of suspension, factors influencing ride comfort, conventional and independent suspension systems, shock absorbs, stabilizers, wheels and tyres.
- understand the transmission system, constructional features of clutch, gear box, differential, front and rear axles, overdrives, propeller shaft, universal joint and torque tube drive, rear wheel drive, front wheel drive and automatic transmission.
- learn mechanical, hydraulic braking system and weight transfer during braking, stopping distances, coil and magneto ignition systems, capacity ratings and battery testing, starter motor and arrangements, voltage and current regulation, preventive maintenance, trouble shooting, engine turning and servicing.

Unit No.	Topics to be Covered	Lecture Hours	Learning Outcome
1	**Introduction:** Basic structure, general layout and type of automotive vehicles, Frameless and unitary construction; position of power unit.	3	To get introduced to general layout and types of automotive vehicles.
2	**Power Unit:**Power requirements - motion resistance, tractive effort and vehicle performance curves; selection of power unit and engine performance characteristics; pollution due to vehicle emission and exhaust emission control system.	6	To understand motion resistance, tractive effort and vehicle performance curves, vehicular pollution and control system.
3	**Chassis and Suspension:** Loads on the frame, considerations of strength and stiffness, different types of chassis and their construction; engine mounting on the chassis, Need of Suspension System, Types of Suspension; factors influencing ride comfort, conventional and independent suspension systems; shock absorbs and stabilizers; wheels and tyres.	7	To understand loads on the frame, different types of chassis and their construction, types of suspension, shock absorbs and stabilizers, wheels and tyres.
4	**Transmission System:** Basic requirements and standard transmission systems; constructional features of automobile clutch, gear box, differential, front and rear axles; overdrives, propeller shaft, universal joint and torque tube drive; Rear wheel Vs front wheel drive, principle of automatic transmission.	7	To understand standard transmission systems and its components,
5	**Steering System:**Requirement and steering geometry; castor action, camber and king pin angle, toe-in of front wheels, steering linkages and steering gears; wheel alignment; power steering.	6	To understand the steering geometry, steering linkages and steering gears, wheel alignment; power steering.

6	**Braking System:**General braking requirements; mechanical, hydraulic, vacuum power and servo brakes; weight transfer during braking and stopping distances.	6	To understand mechanical, hydraulic, vacuum power and servo brakes.
7	**Electric Systems:** Conventional (coil and magneto) and transistorized ignition systems; Charging, capacity ratings and battery testing; starter motor and drive arrangements: voltage and current regulation; lighting and accessory systems.	4	To understand conventional and transistorized ignition systems.
8	**Safety and comfort systems&Maintenance:** Preventive maintenance, trouble shooting and rectification; engine turning and servicing.	3	To understand preventive maintenance, trouble shooting, engine turning and servicing.

Text Books

1. Automotive Mechanics: W. H. Crouse & D. Anglin, Tata McGraw Hill
2. Elements of Automotive Mechanics: Joseph Heitner, Van Nostrand Publication

Reference Books

1. Automotive Mechanics (Principles and Practices)- Joseph Heitner
2. Automobile Engg. (Vol. 1 & 2) – K. M. Gupta, Umesh Publications