

## ME4105PE: Automobile Engineering syllabus

### UNIT - I

**Introduction:** Layout of automobile – introduction chassis and body components. Types of Automobile engines. – Power unit – Introduction to engine lubrication – engine servicing  
**Fuel System:** S.I. Engine: Fuel supply systems, Mechanical and electrical fuel pump – filters carburetor – types – air filters – petrol injection. Introduction to MPFI and GDI Systems.  
**C.I. Engines:** Requirements of diesel injection systems, types of injection systems, DI Systems  
**DI Systems:** Fuel pump, nozzle, spray formation, injection timing, testing of fuel pumps. Introduction to CRDI and TDI Systems.

### UNIT - II

**Cooling System:** Cooling Requirements, Air Cooling, Liquid Cooling, Thermo, water and Forced Circulation System – Radiators – Types – Cooling Fan - water pump, thermostat, evaporative cooling – pressure sealed cooling – antifreeze solutions.  
**Ignition System:** Function of an ignition system, battery ignition system, constructional features of storage, battery, auto transformer, contact breaker points, condenser, and spark plug – Magneto coil ignition system, electronic ignition system using contact breaker, electronic ignition using contact triggers – spark advance and retard mechanism.

**Electrical System:** Charging circuit, generator, current – voltage regulator – starting system, bendix drive mechanism solenoid switch, lighting systems, Horn, wiper, fuel gauge – oil pressure gauge, engine temperature indicator etc.

### UNIT - III

**Transmission System:** Clutches, principle, types, cone clutch, single plate clutch, multiplate clutch, magnetic and centrifugal clutches, fluid fly wheel – gear boxes, types, sliding mesh, constant mesh, synchro mesh gear boxes, epicyclic gear box, over drive or torque converter. Propeller shaft – Hotch – Kiss drive, Torque tube drive, universal joint, differential rear axles – types wheels and tyres.

**Suspension System:** Objects of suspension systems – rigid axle suspension system, torsion bar, shock absorber, Independent suspension system

### UNIT - IV

**Braking System:** Mechanical brake system, Hydraulic brake system, Master cylinder, wheel cylinder tandem master cylinder Requirement of brake fluid, Pneumatic and vacuum brakes.  
**Steering System:** Steering geometry – camber, castor, king pin rake, combined angle toe-in, center point steering. Types of steering mechanism – Ackerman steering mechanism, Davis steering mechanism, steering gears – types, steering linkages.

### UNIT - V

**Emissions from Automobiles** – Pollution standards National and international – Pollution Control – Techniques – Multipoint fuel injection for SI Engines. Common rail diesel injection Energy alternatives Solar, Photo-voltaic, hydrogen, Biomass, alcohols, LPG, CNG, liquid Fuels, and gaseous fuels, Hydrogen as a fuel for IC Engines. - Their merits and demerits. Standard Vehicle maintenance

#### practice. Text Books:

1. Willam H Crouse, Donald L. Anglin, — Automobile Engineering, McGraw-Hill, 10th Edition, 2006.
2. Manzoor, Nawazish Mehdi, Yosuf Ali, — A Text Book Automobile Engineering, Frontline Publications, 1

#### Reference Books:

1. R. K. Rajput, — A Text Book of Automobile Engineering, Laxmi Publications, 1st Edition, 2015.
2. Joseph Heinter, — Automotive Mechanics, CBS, 2nd Edition, 2006.
3. K. Netwon, W. Steeds, T. K. Garrett, — Automotive Engineering, Butterworth-Heinemann, 13th Edition, 2016.
4. S. Srinivasan, — Automotive Engines, Tata McGraw-Hill, 2nd Edition, 2003.
5. Khalil. U. Siddiqui, — A Text Book of Automobile Engineering, New Age International, 1st

