

Professional Elective-I

PEME5301 **AUTOMOBILE ENGINEERING** (3-0-0)

Module I (14 hours)

Introduction

Main units of automobile chassis and body, different systems of the automobile, description of the main parts of the engine, motor vehicle act.

Power for Propulsion

Resistance to motion, rolling resistance, air resistance, gradient resistance, power required for propulsion, tractive effort and traction, road performance curves.

Breaking systems

Hydraulic breaking system, breaking of vehicles when applied to rear, front and all four wheel, theory of internal shoe brake, design of brake lining and brake drum, different arrangement of brake shoes, servo and power brakes.

Module II (12 hours)

Transmission Systems

Layout of the transmission system, main function of the different components of the transmission system, transmission system for two wheel and four wheel drives. Hotchkiss and torque tube drives.

Gear box : Sliding mesh, constant mesh and synchromesh gearbox, design of 3 speed and 4 speed gear box, over drive, torque converter, semi and fully automatic transmission.

Hookes joint, propeller shaft, differential, rear axles, types of rear axles, semi floating, there quarter floating and full floating types.

Module III (14 hours)

Front wheel Geometry and steering systems : Camber, castor, kingpin inclination, toe-in and toe-out, centre point steering condition for true rolling, components of steering mechanism, power steering.

Electrical system of an automobile : Starting system, charging system, ignition system, other electrical system.

Electrical vehicles:

History, electrical vehicles and the environment pollution, description of electric vehicle, operational advantages, present EV performance and applications, battery for EV, Battery types and fuel cells, Solar powered vehicles, hybrid vehicles

Textbooks :

1. Automobile Mechanics , N.K.Giri, Khanna publishers
2. Automobile Engineering, K.M. Gupta, Voll & Il, Umesh Publication

Reference Books

1. Automotive mechanics: William h. Crouse and Donald L. Anglin, TMH
2. The motor vehicle, Newton and Steeds
3. Automobile Mechanics, J. Heitner, East West Press
4. Automobile Engineering, Jain and Asthana, Tata McGraw Hill
5. Automobile Engineering, K.K.Ramalingam, Scitech
6. Automobile Engineering, Vol. I & II, Kirpal Singh, Standard Publications
7. A Text Book of Automobile Engineering, R.K.Rajput, Laxmi Publishers