IV Year B.Tech. Mechanical Engg. I-Semester

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ME427 AUTOMOBILE ENGINEERING

(Dept. Elective - III)

Course Description & Objectives:

The objective of Automobile Engineering is to develop and understand the principles of conversion in design, construction and working of mechanical systems. Graduates will be equipped to solve multi-disciplinary problems and will be part of future developments in industries. It is anticipated that graduates from the course will play a major/lead role in design, management and coordination of multi-disciplinary projects. The scope of this program is to impart knowledge to graduating students on the basics of automobiles, understanding of mechanical analysis and design. To provide students with sound foundation in the mathematical, scientific and engineering fundamentals necessary to formulate, analyze and solve engineering problems and to prepare them for higher studies and for successful careers in automobile industry.

Course Outcomes:

1. *An ability to communicate effectively.*
2. *An ability to identify, formulates, and solves engineering problems.*
3. *Apply knowledge of science, math, statistics, and engineering technology to solve problems encountered in a professional career in the automotive industry.*
4. *Graduates will be familiar with modern engineering software tools and equipment to analyze automotive engineering problems.*
5. *Graduates will be broadly educated and will have an understanding of the impact of engineering on society and demonstrate awareness of contemporary issues.*

UNIT - I Introduction to an Automobile:

Components of four wheeler automobile, chassis, frame, body, engine, cylinder block and crankcase, cylinder head, liners – pistons, connecting rod – engine valves – valve mechanisms.

UNIT - II SI Engine Fuel Supply System:

Types – fuel pumps – carburettors – functions – mixture strength, simple carburettor – defects and remedies – typical carburettors - Solex carburettor, Zenith Carburettor.

CI engine fuel supply system- functional requirements of an injection system – methods of injection – fuel injection pumps – fuel injector – spray formation.

UNIT - III Engine Lubrication:

Objectives of lubrication –requirements of lubricants- Types of lubrication systems– oil pumps and filters.

Cooling system : Objectives of Cooling – methods of cooling – components of air and water cooling systems – radiators.

UNIT - IV Ignition Systems:

Requirements of an ignition system – types of ignition system – battery ignition system, magneto ignition system and electronic ignition system - Ignition advance methods - Spark plug.

Starting system – starting motor – bendex drive – solenoid switch.

UNIT - V Transmission System:

Requirements of transmission system – principle of clutch- types of clutches- cone clutch, single plate clutch, multi plate clutch, magnetic and centrifugal clutches. Gear boxes- Need of gear box- types- sliding mesh, constant mesh, synchro mesh epicyclic type gear box. propeller shaft , Hotch kiss drive, differential and rear axles.

TEXT BOOKS :

1. Heitner, “Automobile Engineering”, 2nd Edition, IPC Transport Press Ltd., 2010.
2. Dr. Kirpal Singh, “Automobile Engineering”, Volume - 1 & 2, 9th Edition, Standard Publishers Distributors, 2009.

REFERENCE BOOKS :

1. K.R. Govindan, “Automobile Engineering”, 1st Edition, Anuradha Publications, 2005.
2. R.K. Rajput, “Automobile Engineering”, 1st Edition, Lakshmi Publications, 2007.