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AKTU B.E./B.Tech MECH Sem 7 syllabus

Automobile Engineering

RME702 Automobile Engineering

UNIT-I: Introduction:

Basic concepts of Automobile Engineering and general configuration of an automobile, Power and Torque characteristics. Rolling, air and gradient resistance. Tractive effort. Gear Box. Gearratio determination.

UNIT-II: Transmission System:

Requirements. Clutches. Torque converters. Over Drive and free wheel, Universal joint. Differential Gear Mechanism of Rear Axle. Automatic transmission, Steering and Front Axle. Castor Angle, wheel camber & Toe-in, Toe-out etc... Steering geometry. Ackerman mechanism, Understeer and Oversteer. Hotchkiss drive and Torque tube drive.

UNIT-III: Braking System:

General requirements, Road, tyre adhesion, weight transfer, Braking ratio. Mechanical brakes, Hydraulic brakes. Vacuum and air brakes. Thermal aspects. Antilock braking system (ABS), electronic brake force distribution (EBD) and traction control. Chassis and Suspension System: Loads on the frame, Strength and stiffness, Independent front & rear suspension, Perpendicular Alarm type, Parallel arm type, Dead axle suspension system, Live axis suspension system, Air suspension & shock absorbers.

UNIT-IV: Electrical System:

Types of starting motors, generator & regulators, lighting system, Ignition system, Horn, Battery etc. Fuel Supply System: Diesel & Petrol vehicle system such as Fuel Injection Pump, Injector & Fuel Pump, Carburettor etc. MPFI.

UNIT-V: Emission standards and pollution control:

Indian standards for automotive vehicles-Bharat I and II, Euro-I and Euro-II norms, fuel quality standards, environmental management systems for automotive vehicles, engine emission control by 3-way catalytic converter system, fuel additives and modern trends in automotive engine efficiency and emission control. Alternative Energy Sources: Alternative energy sources, natural gas, LPG, biodiesel, bio-ethanol, gasohol and hydrogen fuels in automobiles, modifications needed, performance, combustion & emission characteristics of alternative fuels in SI and CI engines, Electric and Hybrid vehicles, application of Fuel Cells. Prevention maintenance and overhauling.

Books and References:

1. Automotive Engineering- Hietner.
2. Automobile Engineering - Narang.
3. Automobile Engineering -TTTI, Pearson India.
4. Automotive Mechanics- Crouse.
5. Automobile Engineering - Newton and Steeds.
6. Automobile Engineering -Ramakrishna, PHI, India.
7. Automobile Engineering - Kripal Singh.
8. Kirpal Singh, Automobile Engineering, 7th ed., Standard Publishers, New Delhi, 1997.