

AUTOMOBILE ENGINEERING
(DIPLOMA STANDARD)

CODE NO: 257

UNIT I - MECHANICS OF MATERIALS:

Structure of metals - Ferrous alloys Non ferrous metals and alloys - Heat Treatment of steel and surface heat treatment or case hardening - Toughening - Normalising – refining-Mechanical properties of materials - Simple Stress and strain – Modulus of elasticity- Shear force, Twist, Theory of simple bending, deflection.

UNIT – II - PRODUCTION TECHNOLOGY:

Foundry - Patterns - Casting Techniques - Welding - Drilling - boring and Jig boring machines – Milling machines - Grinding machine - Cylinder Boring and honing machines. Lathes - Gas welding - Arc welding Brazing and soldering.

UNIT – III - ELECTRICAL AND ELECTRONICS ENGINEERING:

Units and symbols - AC and DC - Electro magnetisms - EMF - DC Circuits - Battery types Dry, Wet - DC Generators - DC Motors and Starters - Transistor - Capacitor - Diodes - Rectifiers - circuit breakers, Electronic components - symbols.

UNIT – IV - BASICS OF MECHANICAL ENGINEERING:

Fluid mechanics : Properties of fluids - flow of fluids - Flow of fluids in closed conduits - Reciprocating pumps - Centrifugal pump – Gear pumps and vane pumps - Hydraulic systems – Thermal Engineering - Properties of Gases - Expansion of Gases - Air cycles – Fuels- Fuel characteristics – Octane number and Cetane number – Lubricants- Viscosity, Flash point, Fire point and Pour point - Air compressors performance - IC Engine performance.

UNIT – V AUTOMOBILE ENGINES:

Principles of 2 stroke and 4 stroke engines - Engines Valve timing, - port timing - Valve arrangements - Engine blocks - cylinder heads - Wet and dry liner - Pistons - connecting rod - Crank shaft - Camshaft - timing gears - valve/ports - Firing order - Static balance - Dynamic balance - cooling systems - Radiators - Lubricating system - Lubricating oil characteristics Crank case ventilation - Engine testing/Fault finding, equipments - Carburation and Carburettors – MPFI - Diesel Engine for Automobile purpose - Combustion process of Diesel engines - Diesel knock – Diesel - combustion chamber types – CRDI - Injectors types - Feed pumps - - Fuel Injection Pumps - Phasing and Calibration - Governors' - Super charges and Turbo Chargers – EGR - Emissions Control system in engines - Maintenance and servicing.

UNIT - VI AUTOTRONICS:

Battery lead acid - types - capacity - coil ignition system - Magneto ignition system and transistorised ignition system - ignition timing - spark plugs - starter motors - Alternators - voltage and current regulator - cutout unit. Flasher unit - wiring looms - circuits lighting - Auto cable - symbols -

UNIT - VII TRANSMISSION AND CONTROLS:

Friction and Transmission of motion - Clutches - Gearboxes - Epicyclic gear box - Pre selector gear box - universal joints - Differential - Floating axles. Constant velocity joints - suspension system - independent front suspension systems - steering types - caster - camber - toe in – toe out – power steering – types - wheel balancing - brakes - Testing its efficiency – Anti-lock braking systems - Tyres - tubes - Types and maintenance- Trouble shooting - Preventive Maintenance and servicing.

UNIT - VIII INDUSTRIAL MANAGEMENT AND ROAD TRANSPORT ORGANIZATION :

Leadership - Morale – Motivation - Production planning and control - Personnel - Materials - Financial Management – Depreciation calculation using straight line method and sinking fund method – ABC analysis. Goods Transport, Passenger transport, Operational Layout of service station and garages - Bus stand - Classification - passenger transport organization and Administrative set up. Motor Vehicle act - Road signals - Traffic signals - Permit - Registering vehicle - Fitness certificate - Ticket system. Study to improve services, Accident claim. Market research - costing in Road transport Running cost.

UNIT - IX BODY BUILDING TECHNOLOGY :

Terminology - classification of motor vehicle body - passenger transport - goods Transport - Cars - Chassis - frame principle - Aerodynamic body considerations. Body shape – NVH – definition - NVH elimination - Bus body construction. Goods vehicle construction - Tanker, Tipper Constructions - Ergonomics of Driver seat design - Painting - Body repairing - maintenance and safety on painting.

UNIT- X COMPUTER INTEGRATED MANUFACTURING:

CAD – Definition – geometric modeling – wireframe, surface and solid modeling – graphic standards – GKS, IGES, PHIGS and DXF. CAM – definition – group technology – part families – parts classification and coding – CAPP – types. CNC – definition – components of CNC – ATC – CNC EDM. Part program – format – coordinate system – types of motion control – types of interpolation – G and M codes – sub program – canned cycles.