

**SYLLABUS  
DIPLOMA IN MECHANICAL ENGINEERING  
SEMESTER – V**

**AUTOMOBILE ENGINEERING**

**Sub. Code: DME 501**

**Credits: 02**

**Total Marks: 100**

**Minimum Pass Marks: 40%**

**Internal Assessment: 40 Marks**

**University Examination: 60 Marks**

**Unit 1:**

Automobile and its Development; Various Types of Automobiles Manufactured In India, their Manufacturer and Location of their Manufacturing Unit; Classification of Automobiles.

**Unit 2:**

Introduction and Classification of I.C. Engines; Engine Terminology; Fuel Systems for Petrol and Diesel Engines Including Multi Point Fuel Injection (MPFI); Common Rail Direct Injection (CRDI); Fuel Injectors and Nozzles. Working Principle of Two Stroke and Four Stroke Engines (Petrol, Diesel) and their Applications.

**Unit 3:**

Clutch: Function, Constructional Details of Single Plate and Multi-plate Friction Clutches, Centrifugal and Semi Centrifugal Clutch, Cone Clutch, Hydraulic Clutch.  
Gear Box: Function, Working of Sliding Mesh, Constant Mesh and Synchromesh Gear Box, Torque Converter and Overdrive,  
Propeller Shaft and Rear Axle: Function, Universal Joint, Differential, Different Types of Rear Axles and Rear Axle Drives.  
Wheels and Tyres: Types of Wheels, Types and Specifications of Tyres used in Indian Vehicles, Toe In, Toe Out, Camber, Caster, Kingpin Inclination, Wheel Balancing and Alignment.

**Unit 4:**

Function and Principle; Ackerman and Davis Steering Gears; Types of Steering; Gears; Worm and Nut; Worm and Wheel; Worm and Roller; Rack And Pinion; Power Steering.

**Unit 5:**

Constructional Details and Working of Mechanical, Hydraulic, Air and Vacuum Brake; Details of Master Cylinder, Wheel Cylinder; Concept of Brake Drum, Brake Lining and Brake Adjustment.

**Unit 6:**

Function, Types and Working of Coil Spring; Leaf Spring; Air Suspension; Shock Absorber: Telescopic Type and Pneumatic Type

**Unit 7:**

Constructional Details of Lead Acid Cell Battery; Specific Gravity of Electrolyte: Effect of Temperature on Specific Gravity; Specification of Battery-Capacity; Rating , Number of Plates, and Selection of Battery for Particular Use

**Unit 8:**

Dynamo: Function and Details, Regulators: Voltage Current and Compensated Type, Cutout: Construction, Working and their Adjustment.

Alternator: Construction and Working, Charging of Battery by Alternator.

**Suggested Readings:**

1. Automobile Engineering, GBS Narang, Khanna Publishers.
2. Automobile Engineering, Dr. Kirpal Singh, Standard Publishers and Distributors.

**Note:**

1. Use of computer based learning aids is advised for effective teaching and learning
2. Eight questions are to be set. Students will have to attempt five questions in all.
3. Use of non-programmable scientific calculator is allowed in Examination Hall.

**SYLLABUS  
DIPLOMA IN MECHANICAL ENGINEERING  
SEMESTER – V**

**PRODUCTION MANAGEMENT**

**Sub. Code: DME 502**

**Credits: 02**

**Total Marks: 100**

**Minimum Pass Marks: 40%**

**Internal Assessment: 40 Marks**

**University Examination: 60 Marks**

**Unit 1:**

Types of Production: Job, Batch and Mass Production; Concept of Planning, Scheduling, Routing, Dispatching and Follow Up; Break Even Analysis and Gantt Chart.

**Unit 2:**

Definition; Factors Affecting the Site Selection of Plant; Factors Affecting Plant Layout; Types of Layout: Process, Product, Combination and Fixed Position, Layout Patterns; Techniques of Making Layout: Flow Diagram, Templates, Distance Volume Matrix and Travel Chart.

**Unit 3:**

Definition, Advantages and Procedure of Work Study; Difference between Production and Productivity; Measures to Improve Productivity; Method Study: Definition, Objectives and Procedure; Symbols, Flow Process Chart, Flow Diagram, Machine Chart and Two Hand Chart; Principles of Motion Economy; Therblig Symbols; Simo Chart.

**Unit 4:**

Material Purchasing; Store Keeping; Functions and Duties of Store Department; Definition of Inventory; Types of Inventory; ABC Analysis; Procurement Cost; Carrying Charges; Lead-Time; Reorder Point; Economic; Ordering Quantity; Codification and Standardization; Concept of JIT.

**Unit 5:**

Inspection Need, Types of Inspection, Stages of Inspection; Statistical Quality Control; Process Capability; Control Charts for Variables:  $\bar{X}$  and R Chart; Control Chart for Fraction Defectives (P Chart); Control Chart for Number of Defects (C Chart)

**Unit 6:**

Principles of Economic Material Handling; Hoisting Equipment: Fork Lift Truck, Cranes: Mobile Motor Cranes, Overhead Cranes, Traveling Bridges Crane, Derrick Crane; Conveying Equipment

**Suggested Readings:**

1. Industrial Engineering and Management, T.R. Banga and SC Sharma, Khanna Publishers.
2. Industrial Engineering and Management, O.P. Khanna, Dhanpat Rai and Sons.
3. Production Management, K.P.S Chauhan, Eagle Prakashan.

**Note:**

1. Eight questions are to be set.. Students will have to attempt five questions in all.
2. Use of non-programmable scientific calculator is allowed in Examination Hall.

**SYLLABUS  
DIPLOMA IN MECHANICAL ENGINEERING  
SEMESTER – V**

**MACHINE DESIGN**

**Sub. Code: DME 503**

**Credits: 02**

**Total Marks: 100**

**Minimum Pass Marks: 40%**

**Internal Assessment: 40 Marks**

**University Examination: 60 Marks**

**Unit 1:**

Design: Definition, Type of Design, Necessity of Design; Comparison of Designed and Undesigned Work: Design Procedure, Characteristics of a Good Designer; Design Terminology: Stress, Strain, Factor of Safety.

**Unit 2:**

Properties of Engineering Materials: Elasticity, Plasticity, Malleability, Ductility, Toughness, Hardness and Resilience, Fatigue, Creep, Tenacity and Strength; Selection of Materials, Criterion of Material Selection.

**Unit 3:**

Various Design Failures; Maximum Stress Theory; Maximum Strain Theory; Design for Tensile; Compressive and Torsional Loading.

**Unit 4:**

Type of Shaft; Shaft Materials; Type of Loading on Shaft; Standard Sizes of Shaft Available; Shaft Subjected to Torsion Only; Determination of Shaft Diameter.

**Unit 5:**

Types of Key; Materials of Key; Functions of Key; Failure of Key: by Shearing and Crushing; Design of Key: Determination of Key Dimension; Effect of Keyway on Shaft Strength.

**Unit 6:**

Types of Joints: Temporary and Permanent Joints; Utility of Various Joints. Spigot and Socket Joint. Different Modes of Rivet Joint Failure; Design of Riveted Joint: Lap and Butt, Single and Multi Riveted Joint.

**Suggested Readings:**

1. Machine Design, R.S. Khurmi and JK Gupta, Eurasia Publishing House Limited.
2. Machine Design, V.B.Bhandari, Tata McGraw Hill.
3. Engineering Design, George Dieter; Tata McGraw Hill.

4. Mechanical Engineering Design, Joseph Edward Shigley, McGraw Hill.

**Note:**

1. Eight questions are to be set. Students will have to attempt five questions in all.
2. Use of non-programmable scientific calculator is allowed in Examination Hall.
3. Drawing of any two designed components to be made using CAD.

**SYLLABUS  
DIPLOMA IN MECHANICAL ENGINEERING  
SEMESTER – V**

**POWER PLANT ENGINEERING**

**Sub. Code: DME 504**

**Credits: 02**

**Total Marks: 100**

**Minimum Pass Marks: 40%**

**Internal Assessment: 40 Marks**

**University Examination: 60 Marks**

**Unit 1:**

Energy Resources and their Availability; Types of Power Plants, Selection of the Plants, Electrical Safety.

**Unit 2:**

Schematic Arrangement of Hydroelectric Power Station; Construction and Operation of Different Components of Hydro-Electric Power Plants; Site Selection; Comparison with other Types of Power Plants.

**Unit 3:**

Steam Fundamentals; Schematic Arrangement; Choice of Site; Efficiency of Steam Power Plants; Equipments; Boilers & Steam Generators; Boiler Auxiliaries.

**Unit 4:**

Constant Pressure Gas Turbine Power Plants; Arrangements of Combined Plants: Steam & Gas Turbine Power Plants; Re-Powering Systems: with Gas Production from Coal, Organic Fluids; Parameters Affecting Thermodynamic Efficiency of Combined Cycles.

**Unit 5:**

Principles of Nuclear Energy; Basic Nuclear Reactions; Nuclear Reactors Fission Theory; Steam Supply; Operation and Maintenance; Reactor Safety; Cooling Towers; Water Treatment; Advantages and Limitations; Waste Disposal.

**Unit 6:**

Load Curve; Different Terms and Definitions; Cost of Electrical Energy; Tariffs Methods of Electrical Energy; Performance & Operating Characteristics of Power Plants; Incremental Rate Theory.

**Suggested Readings:**

1. Power station Engineering and Economy, Bernhardt G.A. Skrotzki and William A. Vopat, Tata McGraw Hill.

2. Power Plant Engineering, P.K. Nag, Tata McGraw Hill.
3. Power Plant Technology, M.M. El-Wakil, McGraw Hill.

**Note:**

1. Eight questions are to be set. Students will have to attempt five questions in all.
2. Use of non-programmable scientific calculator is allowed in Examination Hall.



**SYLLABUS  
DIPLOMA IN MECHANICAL ENGINEERING  
SEMESTER – V**

**COMPUTER AIDED DESIGN**

**Sub. Code: DME 505**

**Credits: 04**

**Total Marks: 150**

**Minimum Pass Marks: 40%**

**Internal Assessment: 75 Marks**

**University Examination: 75 Marks**

**Unit 1:**

Concept of AutoCAD, Tool Bars in Auto CAD, Coordinate System, Snap, Grid and Ortho Mode; Drawing Commands: Point, Line, Arc, Circle and Ellipse; Editing Commands: Scale, Erase, Copy, Stretch, Lengthen and Explode.

**Unit 2:**

Detail and Assembly Drawing using AutoCAD: Journal Bearing, Wall Bracket, Stepped Pulley, V-Belt Pulley, Flanged Coupling, Spur Gear and Screw Jack.

**Unit 3:** Isometric Drawing by CAD using Auto CAD: Cone: Cylinder and Isometric View of Objects.

**Unit 4:**

3D Modeling; Transformations, Scaling, Rotation and Translation.

**Unit 5:**

Pro Engineer or CATIA: Salient Features, Simple Drawing of Components: 2D and 3D.

**Suggested Readings:**

1. Engineering Drawing with AutoCAD 2000, T. Jeyapooran, Vikas Publishing House.
2. AutoCAD for Engineering Drawing Made Easy, P. Nageswara Rao, Tata McGraw Hill.
3. AutoCAD 2000 for you, Umesh Shettigar and Abdul Khader, Janatha Publishers.

**Note:**

1. Eight questions are to be set, at least one question from each unit. Students will have to attempt five questions in all.
2. Use of non-programmable scientific calculator is allowed in Examination Hall.