

**Course Name** : Diploma in Mechanical Engineering  
**Course Code** : DME  
**Semester** : Third  
**Subject Title** : Mathematics III  
**Subject Code** : 134MA31e

**Teaching & Examination Scheme**

Teaching Scheme			Paper Hours	Examination Scheme											Total Marks
L	T	P		Theory		Test	Total		PR		OR		TW		
				Max	Min		Max	Min	Max	Min	Max	Min	Max	Min	
3	1	-	3	80	32	20	100	40	-	-	-	-	25	10	125

**Rationale :**

The study of mathematics is necessary to develop the skills essential for solving engineering problems. Integral calculus is routinely needed by engineers in calculations. Statistics is a widely used subject applicable to all fields of engineering in order to analyze data and derive meaningful inferences.

**Objective:**

1. To make students well versed in various methods of integration for solving problems.
2. To introduce students to various numerical methods.
3. To expose students to techniques of solving differential equations.
4. To introduce students to statistics.

Sr. No.	Contents	L	M
	<b>Section-I</b>		
1	<b>Integration</b> 1.1 Definition of integration. Integration of standard functions. 1.2 Theorems of integration. 1.3 Methods of Integration 1.3.1 Integration by substitution 1.3.2 Integration of rational functions. 1.3.3 Integration by partial fractions. 1.3.4 Integration by parts. 1.4 Definite Integration 1.4.1 Definition of definite integral. 1.4.2 Properties of definite integral with simple problems.	19	28
2	<b>Numerical Methods</b> Solution of algebraic equations 2.1 Bisection method 2.2 Regula-falsi method 2.3 Newton-Raphson method	06	12

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<b>Section-II</b>			
3	Differential Equations: 3.1 Order and degree of the differential equation. 3.2 Solution of differential equation of first order, first degree. 3.2.1 Variable separable method. 3.2.2 Homogeneous differential equation. 3.2.3 Exact differential equation. 3.2.4 Linear differential equation.	08	16
4	Statistics: 4.1 Mean, Standard Deviation, Variance, Coefficient of variation for raw and classified data. 4.2 Probability 4.2.1 Sample space and events. 4.2.2 Concept of probability. 4.2.3 Conditional probability and independence. 4.2.4 Addition theorem, multiplication theorem,	15	24
<b>Total</b>		<b>48</b>	<b>80</b>

**REFERENCE BOOKS:**

- 1) Applied Mathematics - B.M.Patel, J.M.Rawal and others – Nirali Prakashan, July-2010
- 2) Mathematics for Polytechnic - S. P. Deshpande- Pune Vidyarthi Griha Prakashan.
- 3) Fundamental of Mathematical Statistics - S.C.Gupta and Kapoor - S.Chand & Sons

**Course Name** : Diploma in Mechanical Engineering  
**Course Code** : DME  
**Semester** : Third  
**Subject Title** : Strength of Materials  
**Subject Code** : 134SE32

### Teaching & Examination Scheme

Teaching Scheme			Paper Hours	Examination Scheme											Total Marks
L	T	P		Theory		Test	Total		PR		OR		TW		
				Max	Min		Max	Min	Max	Min	Max	Min	Max	Min	
3	-	2	3	80	32	20	100	40	-	-	-	-	25	10	125

#### Rational:

This course in Mechanics of Structure is pre-requisite to understand Theory of machines and Machine Design. The effect of different types of loads that may act on the machine parts will be in various ways. The engineer has to decide whether the material of which, the machine is made can develop enough strength to resist these loads safely. This course, therefore, covers the topics such as bending theory, stress on oblique planes, deflection of the structures due to various types of loads etc.

#### Objective:

Student will be able to:

1. Calculate Stresses in simple and complex section.
2. Calculate deformations of the specimen subjected to uni-axial, biaxial and tri-axial stress system.
3. Draw shear force and bending moment diagram.
4. Calculate moment of inertia of standard plane section and their components.
5. Calculate shear stress and bending stress in beam cross section.
6. Calculate shear stress due to torsion.
7. Calculate deflections.

### Syllabus

Sr. No.	Contents	L	M
1	Stress and Strain: Hook's law. Modulus of elasticity, Modulus of rigidity, Bulk Modulus, Poisson's ratio, simple shear, complementary shear,		

	relation between E, G, K. Behavior of mild steel under tension, load extension curve, yield stress, factor of safety, working stresses. Temperature stresses. Stresses in composite sections under axial loading..	08	15
2	Beams: Bending moments, shear force and axial forces in simply supported cantilever and overhanging beams. Plotting of B.M.D., S.F.D., and A.F.D. for concentrated and uniformly distributed loads. Relation between shear force and bending moments at a section, point of contra	08	13
3	Simple theory of Bending: Flexure formula for straight prismatic beams, Principle axes and moment of a section, moment of resistance, simple problem in application of flexure formula, flitched beams.	06	12
4	Shear stresses: Distributions of shear stresses across plane section and I beams.	02	12
Section II			
5	Bending combined with axial loads: Eccentric loading of a section, middle third rule, core of section.	04	09
6	Principle stresses and Principle planes: Stresses in oblique planes, principle plane and stresses, Analytical and Graphical methods	04	10
7	Thin Cylindrical and spherical shells	04	09
8	Torsion : Theory of Pure Torsion, Analysis and design problems of shaft subjected to pure torsion	06	10
9	Deflection of beams: Double integration method, moment area method and conjugate beam Method. Application to simply supported beams, cantilever and over hanging beams.	06	10
<b>Total</b>		<b>48</b>	<b>80</b>

**Term Work:**

Laboratory journal containing at least six experiments out of the following:

Sr. No.	Name of Experiments
1	Tension test on M.S. bar.
2	Brinell Hardness Test on M.S., C.I. & Brass specimen
3	Izod impact test on M.S. bar and brass specimen
4	Torsion test on M.S specimen
5	Shear test on M.S. , C.I. brass specimen
6	Transverse test on Cast Iron
7	Tension Test on Cast Iron.

**Text Books:**

<b>Sr. No.</b>	<b>Title of Book</b>	<b>Author</b>	<b>Edition &amp; Publication</b>
1	Mechanics of structures	S. B. Junnarkar	21th Edition 2010,Charotar Publishing. House

**Reference Books:**

<b>Sr. No.</b>	<b>Title of Book</b>	<b>Author</b>	<b>Edition &amp; Publication</b>
1	Strength of Materials	S. Ramamrutham	15 <sup>th</sup> Edition 2006, Dhanpat Rai
2	Strength of materials	C.H. Ryder.	2002, Macmillan publishers

**Course Name : Diploma in Mechanical Engineering**  
**Course Code : DME**  
**Semester : Third**  
**Subject Title : Basics of Electrical and Electronics Engineering**  
**Subject Code : 134EE33**

**Teaching & Examination Scheme**

Teaching Scheme			Paper Hours	Examination Scheme											Total Marks
L	T	P		Theory		Test	Total		PR		OR		TW		
				Max	Min		Max	Min	Max	Min	Max	Min	Max	Min	
4	-	2	3	80	32	20	100	40	-	-	25	10	25	10	150

**Rationale:**

This subject is an introductory course on the basics of Electrical Engineering and Electronics. It aims at making the student familiar with various electrical circuits, electrical machines, electronic components and their applications.

**Objectives:**

- 1) To understand principles and laws used in basic electrical engineering
- 2) To understand the working of different electrical machines and their applications.
- 3) To understand the working of electronic components & their applications.

**Syllabus**

**Part I: - Theory**

Chapter	Name of the Topic	Hours	Marks
<b>SECTION - I</b>			
1	<b>Electricity Fundamentals:</b> Voltage, Current , Power and their relation. Resistance, Ohm’s Law and Temperature effect on resistance. Series Circuit, Parallel Circuit & Kirchhoff laws. Mesh analysis and Node analysis of simple electric circuits. (Problems having 2 equations only). Concept of Inductor & Capacitor elements. Faraday’s law of Electromagnetic Induction.	8	10

	Force experienced by a current carrying conductor when placed in a magnetic field.		
2	<b>A.C Fundamental's:</b> Alternating Current and Voltage Terms related with alternating quantity R.M.S value, average value Phasor representation of ac quantities.	4	06
3	<b>3-Phase Circuits:</b> Concept of 3-phase Balanced three phase circuit's star and delta connection. Their voltage current and power relationships.	3	04
4	<b>Electrical Machines:</b> i) Construction and principle of operation of single phase transformer. EMF equation of transformer (without derivation). ii) Construction and principle of operation of DC machine. EMF equation of a DC machine ( without derivation). iii) Types of DC Motors - Shunt, Series, Compound, their working, speed torque characteristics and applications. iv) Types of AC Motors – Single phase Induction motor & three phase Induction motor, their working, speed torque characteristics and applications. v) Stepper Motor – working principle and applications	17	20
<b>SECTION - II</b>			
5	<b>Diodes:</b> i) Review of Intrinsic & Extrinsic Semiconductor materials. P type & N type Semiconductor materials. Construction of Germanium & Silicon PN junction diodes. Forward and Reverse I/V characteristics of diode. Temperature effect on diode. ii) Application of diode in Half wave & Full wave rectifier (Center Tap Transformer & Bridge type) circuits. Formula for average load voltage & current ( no derivation) iii) Capacitor C and Inductor L Filter circuits. iv) Zener diode operation and V/I characteristics. Application of Zener diode in a simple voltage regulator circuit v) Light Emitting Diodes (LED) working, forward characteristics& applications. Seven segment display application. vi) Photodiode construction and application.	17	20

6	<b>Bipolar Junction Transistor:</b> Construction of PNP & NPN type of BJT. Common Base, Emitter & Collector configurations. Input and output characteristics of CE configuration. Current gain alpha, beta and relation between them. Common Emitter small signal voltage amplifier application. Common Emitter switch application.	10	12
7	<b>Silicon Controlled Rectifier:</b> Construction of Silicon Controlled Rectifier, its operation & characteristics. Use of SCR in single phase controlled rectifier (Converter) circuit. Use of SCR in Inverter application.	05	08
	<b>Total</b>	<b>64</b>	<b>80</b>

## Part –II :Practicals :

### List of experiments:

- 1) To verify Kirchhoff's Current and Voltage Laws.
- 2) To observe and study construction details of Transformer, DC Motors, Induction Motors.
- 3) To perform load test on single phase transformer and calculate its efficiency.
- 4) To perform speed control of dc shunt motor.
- 5) To perform speed control of three phase slip ring induction motor.
- 6) To plot forward and reverse voltage/current characteristics of Germanium and Silicon diode.
- 7) To measure average load voltage and current for half wave and full wave rectifier circuits.
- 8) To provide capacitor filter for half wave and full wave rectifier circuits
- 9) To plot forward V/I characteristics of Red, Green, Yellow & Blue LED's.
- 10) To plot reverse characteristics of Zener Diode.
- 11) Use of Zener diode in simple voltage regulator circuit.
- 12) Use of Common Emitter Bipolar Junction Transistor in Voltage Amplifier.
- 13) Use of Common Emitter Bipolar Junction Transistor as a Switch.
- 14) Study of single phase half wave phase controlled rectifier (Converter) circuit using SCR.



**Text Book:**

Basic Electrical & Electronics Engineering, 4<sup>th</sup> edition by J.B.Gupta,  
S. K. Kataria&Sons Publications.

**Reference Books:-**

- 1) Fundamentals of Electrical Engineering and Electronics, 28<sup>th</sup> Edition by B.L.Theraja, S Chand Publications.
- 2) Basics of Electrical & Electronics Engineering by A.P.Godse, U.A.Bakshi, Technical Publications, 2007.
- 3) Basic Electrical & Electronics Engineering by R.K.Rajput, 2<sup>nd</sup> Edition, Laxmi Publications.

**Course Name : Diploma in Mechanical Engineering**  
**Course Code : DME**  
**Semester : Third**  
**Subject Title : Manufacturing Processes - I**  
**Subject Code : 134ME34**

**Teaching & Examination Scheme**

Teaching Scheme			Paper Hours	Examination Scheme											Total Marks
L	T	P		Theory		Test	Total		PR		OR		TW		
				Max	Min		Max	Min	Max	Min	Max	Min	Max	Min	
3	-	3	3	80	32	20	100	40	25	10	-	-	50	20	175

**Rationale:**

Manufacturing Process is a core technology subject for mechanical engineering course. Manufacturing is the basic area for any mechanical engineering technician. The technician should be introduced to the basic processes of manufacturing. This subject will help the student to be familiarized with working principles and operations like forging, rolling, extrusion, lathe, drilling, casting, welding, brazing and soldering etc which are the basic manufacturing processes.

The basic knowledge of these processes will be helpful to select the most appropriate process for getting the desired results in terms of getting the raw material converted to finished product as per the requirements.

**Objectives:**

The student will be able to

1. know and identify basic manufacturing processes for manufacturing different components.
2. operate & control different machines and equipments.
3. inspect the job for specified dimensions.
4. produce jobs as per specified dimensions.
5. select the specific manufacturing process for getting the desired type of output.
6. adopt safety practices while working on various machines.

**Syllabus**

Chapter	Name of the Topic	Hours	Marks
<b>Section – I</b>			
01	<b>Foundry:</b> 1.1 <b>Types of Foundries</b> , Advantages and disadvantages of foundry process. 1.2 <b>Pattern Making</b> 1.2.1 Pattern materials and their selection.	08	14

	<p>1.2.2 Types of pattern and their selection.  1.2.3 Pattern Allowances.  1.2.4 Pattern colour coding.</p> <p><b>1.3 Moulding:</b>  1.3.1 Hand Moulding tools and flasks.  1.3.2 Moulding sand: Composition, Types and properties.  1.3.3 Classification of moulding processes.  1.3.4 Core, core print and core boxes.</p> <p><b>1.4 Casting:</b>  1.4.1 Gating and risering of sand castings.  1.4.2 Types &amp; working: Die casting and centrifugal casting.  1.4.3 Defects in casting : causes and remedies</p>		
02	<p><b>Mechanical Working of Metals:</b>  <b>2.1 Forging</b>  2.1.1 Forging processes - Drop forging, Upset forging, Die forging or press forging.  2.1.2 Types of dies like open die, closed die (Single Impression and Multi-impession), Closed die forging operations - Fullering, Edging, Bending, Blocking, Finishing  2.1.3 Forgeable material and forgeability  <b>2.2 Rolling and Extrusion</b>  2.2.1 Principles of rolling and extrusion.  2.2.2 Hot and cold rolling.  2.2.3 Types of rolling mills.  2.2.4 Different sections of rolled parts.  2.2.5 Methods of extrusion – Direct, Indirect, Backward and impact Extrusion, Hot extrusion, Cold extrusion.  2.2.6 Advantages, disadvantages and applications.  <b>2.3 Sheet Metal Working</b>  2.3.1 Cutting operations  2.3.2 Forming operations</p>	07	10
03	<p><b>Welding:</b>  3.1 Classification.  3.2 Gas welding techniques.  3.3 Types of welding flames.  3.4 Arc Welding – Principle, Equipment, Applications.  3.6 Submerged arc welding.  3.7 TIG / MIG welding.  3.8 Resistance welding – Spot welding, Seam welding, Projection welding.  3.10 Brazing and soldering: Types, Principles, Applications.</p>	06	10
04	<p><b>Plastic Moulding:</b>  4.1 Types of plastic  4.2 Compression moulding, Transfer moulding, Injection moulding, Blow moulding, Vacuum forming, Extrusion, Calenderin</p>	03	06
<b>Section – II</b>			
05	<b>The Lathe</b>	10	16

	<p>5.1 Types of lathes – light duty, Medium duty and heavy duty geared lathe, CNC lathe.</p> <p>5.2 Specifications.</p> <p>5.3 Basic parts and their functions. Operations and tools – Turning, parting off, Knurling, Facing, Boring, drilling, threading, step turning, taper turning.</p> <p>5.4 Angle calculations for taper turning.</p> <p>5.5 Cutting tool nomenclature and tool signature.</p> <p>5.6 Cutting parameters and machining time calculation.</p> <p>5.7. Attachments</p> <p>5.8 Turret and Capstan Lathe</p>		
06	<p><b>Single Point Cutting Tools:</b></p> <p>6.1 Geometry of single point cutting tools.</p> <p>6.2 Effect of tool geometry on cutting parameters such as speed, depth of cut, cutting fluids and surface finish.</p> <p>6.3 Types of single point cutting tools - Solid, Tipped, Brazed tip, Throwaway inserts and Adjustable inserts.</p> <p>6.4 Tool life. Factors affecting the tool life.</p>	08	12
07	<p><b>Shaper/Planner/Slotter</b></p> <p>7.1 Principle of working.</p> <p>7.2 Operations,</p> <p>7.3 Advantage and disadvantages.</p> <p>7.4 Applications.</p>	06	12

Sr.No.	Details Of Practical Contents
01	<p><b>PATTERN MAKING</b></p> <p>One job on single piece pattern. One job on split pattern.</p>
02	<p><b>MACHINE TOOL DEMONSTRATION:</b></p> <p>Machines such as drilling machine, shaper, grinding and milling machines should operated and demonstrated.</p>

**Text Books:**

1. Production Technology, P.C. Sharma ,S. Chand Publications,Third edition- 2009

**Reference Books:**

1. Workshop Technology - Volume I & II, B.S.Raghuvanshi, Dhanpat Rai & Co , Ninth Edition 2002
2. Manufacturing Technology, R.K. Rajput, Laxmi Publication (P) Ltd. First edition 2007
3. Workshop Technology - Volume 1 S. K. Hajra Chaudhary ,Media Promoters and Publishers limited, Eighth edition-1986

**Course Name : Diploma in Mechanical Engineering**  
**Course Code : DME**  
**Semester : Third**  
**Subject Title : Engineering Metallurgy**  
**Subject Code : 134ME35**

**Teaching & Examination Scheme**

Teaching Scheme			Paper Hours	Examination Scheme										Total Marks	
L	T	P		Theory		Test	Total		Pract		Oral		Termwork		
				Max	Min		Max	Min	Max	Min	Max	Min	Max		Min
3	-	2	3	80	32	20	100	40	-	-	-	-	25	10	125

**Rationale:** Engineering Metallurgy is a core technology subject in Mechanical Engineering Discipline. A Mechanical engineering diploma holder deals with various materials required for cutting tools, Dies, Gears, Bearings and many other applications. Knowledge of selection of proper tool materials and their alloys for various engineering application.

**Objective:** At the end of this course students will be able to

- Know the properties of Engineering materials like Metals, non-metals, ferrous metals and non-ferrous metals.
- Interpret Iron-Iron Carbide phase equilibrium diagram to find temperature for heat treatment process.
- Select the proper materials for different applications like cutting tools, dies, gears and other applications.
- Understand various heat-treatment process and its applications for various components to improve its mechanical properties.
- Understand powder metallurgy process and its application.
- Understand Non destructive testing methods and its application.

**Syllabus**

**Part I -Theory**

Sr. No	Contents	L	M
<b>Section-I</b>			
1.0	Engineering Materials and their Properties - 1.1 Introduction, Classification and Application of Engineering materials. 1.2 Properties of metals :- Physical Properties – Structure, Density, Melting Point. Mechanical Properties-Strength, elasticity, ductility,	02	05

	malleability, plasticity, toughness, hardness, brittleness.		
2.0	<p>Solid Crystalline Structure-</p> <p>2.1 Crystallisation of liquid into solid state, Nucleation and growth in metals and alloys. Formation of polycrystalline and single crystals.</p> <p>2.2 Classification of crystal structure. FCC,BCC and HCP lattice. Lattice structure, unit cell, packing density and co-ordination number. Their importance.</p>	03	05
3.0	<p>Constitution of Alloys–</p> <p>3.1 Introduction, significance of alloying, Definition, classification and properties of different types of alloys, pure metal, interstitial and intermetallic compounds, solid solution and its types.</p> <p>3.2 phase rule, cooling curves for pure metals and alloys, phase diagrams.</p> <p>3.3 Equilibrium diagram of a binary system in which there is a complete solubility in liquid and solid state (copper - nickel phase diagram)</p> <p>3.4 Equilibrium diagram of a binary system in which there is complete solubility in the liquid state and complete insolubility in solid state (Lead - Antimony phase diagram).</p> <p>3.5 Equilibrium diagram of a system in which complete Solubility in liquid state and limited solubility in solid state and solid solubility decrease with the temperature (Lead - tin phase diagram).</p>	7	12
4.0	<p>Non - Ferrous Metals and Alloys –</p> <p>4.1 Copper and its alloys.</p> <p>4.2 Aluminum and its alloys.</p> <p>4.3 Nickel and its alloys.</p> <p>4.4 Zinc and its alloys.</p> <p>4.5 Lead and its alloys.</p>	04	06
5.0	<p>Iron - Carbon Equilibrium Diagram –</p> <p>5.1 Importance of Iron as Engineering material, Allotropy of iron.</p> <p>5.2 Introduction and study of transformation in iron - carbon equilibrium diagram, definition of structures, study of microstructures.</p> <p>5.3 effect of carbon content on structure and properties of plain carbon steels, critical temperature lines, effect of minor constitutes.</p> <p>5.4 Introduction to TTT curves.</p>	09	12

	<b>Total of Section I</b>	<b>25</b>	<b>40</b>
	<b>Section-II</b>		
6.0	Heat - Treatment of Steels– 6.1 Introduction to the Technology of Heat treatment, classification of heat treatment process. 6.2 Annealing, normalizing, hardening and tempering of steels. 6.3 Surface heat treatments (case hardening) a) Chemical heat treatments such as carburising, nitriding, cyaniding. b) Flame hardening, Induction hardening.	09	14
7.0	Classification. Properties and Uses of Steels– 7.1 Plain Carbon Steels. 7.2 Alloy Steels: Classification, purposes of alloying, effect of alloying elements, nickel, chromium, manganese, Molybdenum, tungsten; Vanadium, silicon, Manganese steels. 7.3 Stainless Steel: Classification, properties and uses. 7.4 Tool Steels: Classification, properties, uses, heat treatment of tool steels.	05	08
8.0	Cast Irons– 8.1 White, gray, Malleable, chilled, S.G. Manganese Cast iron, alloy cast irons. 8.2 Effect of constituents, such as silicon, sulfur, Manganese, phosphorous on cast iron. 8.3 Mechanical properties and uses of different-cast iron.	03	06
9.0	Powder Metallurgy– 9.1 Powder metallurgy process, preparation of the metal powder, characteristic of metal powders, mixing compacting, sintering. 9.2 Advantages and disadvantages of powder metallurgy, application of powder metallurgy.	03	06
10.0	Non Destructive Testing– 10.1 Importance of Non-destructive testing. Difference between Destructive and Nondestructive testing. 10.2 Nondestructive testing methods- Radiography x-ray and gamma ray, Magnetic Particle Inspection, fluorescent penetrant test, Ultrasonic Test, Eddy Current test. Applications of these tests.	03	06
	<b>Total of Section II</b>	<b>23</b>	<b>40</b>
	<b>Total of Section I &amp; II</b>	<b>48</b>	<b>80</b>

### Part II- Practicals

1. Brinell/vickers hardness test
2. Develop specimen for metallographic examination, to reveal out its microstructure.
3. Optical metallurgical microscope to understand the construction & working principle of metallurgical microscope.
4. Phase diagram.

5. Iron-Carbon equilibrium diagram.
6. Heat treatment process and their applications.
7. Jominy end quench test for evaluation of hardenability of given materials.
8. Study of Ferrous metals and Non ferrous metals and alloys.
9. Discussions on commonly used materials for different engineering components.

Students shall submit journal containing term work, practicals, assignments based on syllabus.

**Learning Resources:**

**Text Books:**

1. Material Science and Metallurgy by V. D. Kodgire, Everest Publishing House, 34<sup>th</sup> Edition 2013.
2. A Text Book of Material Science and Metallurgy by O.P.Khanna, Dhanpat Rai and Sons.
3. Material Science and Metallurgy by R.K.Rajput, S.K.Katari and Sons.



**Course Name : Diploma in Mechanical Engineering**  
**Course Code : DME**  
**Semester : Third**  
**Subject Title : Computer Aided Machine Drawing - I**  
**Subject Code : 134ME36**

### Teaching & Examination Scheme

Teaching Scheme			Paper Hours	Examination Scheme											Total Marks
L	T	P		Theory		Test	Total		Pract		Oral		Termwork		
				Max	Min		Max	Min	Max	Min	Max	Min	Max	Min	
2	-	3	-	-	-	-	-	50	20	-	-	50	20	100	

**Rationale:** The subject Machine Drawing – I deals with more complicated problems on sections of solids, reading orthographic views. Apart from this the course contains the topics as intersection of solid surfaces, different types of fasteners, keys, couplings & joints. This course envisages reinforcing and enhancing the knowledge and skill acquired in the earlier two courses viz. Engineering Graphics I & Engineering Graphics II.

**Objective:** At the end of this course students will be able to

- To understand the drawing details of the standard machine components.
- To understand simple assemblies of different joints and couplings.

### Syllabus

#### Part I -Theory

Sr. No	Contents	Hrs
1	Projections of Solids: Axis of solids inclined to both H.P. and V.P.	03/02P
2	Intersection of surfaces: Curves of inter-penetration when a cylinder, prisms, pyramid or cone is penetrated by either a cylinder or a prism vertically and/ or horizontally as per the case	06/03P
3	Reading advanced multi views orthographic projections: Complex shaped machine parts including sectional views.	05L/05P
4	Permanent fasteners: Rivets and riveted joints, symbolic representation of welded joints	03L/1P
5	Detachable fasteners: Free hand sketching various thread profiles. Left & right hand threads, multi start threads, special purpose bolts, special purpose	03L/1P

	nuts, types of washers, stud bolt types of screws, locking arrangements of nuts	
6	Keys and Couplings: Different types of keys, couplings – flanged, protected, flexible, muff, Split muff type and universal joint	03/1P
7	Cotter Joints Cotter joints, Spigot and socket type, sleeve type, strap type, gib and cotter type, double gib type etc.	02/1P
8	Pin joints and knuckle joints.	02
9	Auxiliary Projections.	04/2P

### Part II- Practicals

Sr No	Topic	Paper/CAD Drawings
1	Projections of solids	3
2	Intersection of solids	6
3	Missing Views	5
4	Auxiliary views	2
5	Free hand sketches	7

### Practical (Term work)

Students should prepare one A2 size sheet on every practical day based on that day's lecture. These sheets will be assessed regularly. As a part of exercise in the free hand sketching, students should visit textile workshop, automobile lab, heat engine lab, mechanical workshop etc. to get acquainted with machine elements. Models of various components studied under missing views, intersections of solids are to be made using "Computer Aided Drafting" techniques. Adequate number of assignments (not less than 15 sheets); going up to 24 (including the report and projects as mentioned above) are expected in a semester.

### Learning Resources:

#### Text Books

1. Engineering Drawing : N.D.Bhat , Charotar Publishers,49th Edition 2010
2. Machine Drawing : N.D Bhatt, Charotar Publishers,38th edition 2003

#### Reference Books:-

1. Machine Drawing : P.S.Gill, S.Kataria & sons, 3rd edition 2007
2. Machine Drawing :Siddeshwar, Tata McGraw Hill Publications,2005

**Course Name** : Diploma in Mechanical Engineering  
**Course Code** : DME  
**Semester** : Third  
**Subject Title** : Student Center Activity/Test

Teaching Scheme			Paper Hours	Examination Scheme											Total Marks
L	T	P		Theory		Test	Total		PR		OR		TW		
			Max	Min			Max	Min	Max	Min	Max	Min	Max	Min	
-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	

**Rationale:–**

Most of the diploma holders join industries. Due to globalization and competition in the industrial and service sectors the selection for the job is based on campus interviews or competitive tests.

While selecting candidates a normal practice adopted is to see general confidence, ability to communicate and attitude, in addition to basic technological concepts.

The purpose of introducing professional practices is to provide opportunity to students to undergo activities which will enable them to develop confidence. Expert lectures, E-learning sources, E-library, Internet, seminars on technical topics and group discussion are planned in a semester so that there will be increased participation of students in learning process.

Objectives:

The Student will be able to:

1. Acquire information from different sources
2. Prepare notes for given topic
3. Present given topic in a seminar
4. Interact with peers to share thoughts
5. Take the advantages of E-learning sources

