

## DE ME SEM-1 Detail Syllabus of Mechanical Drafting ( 3321901)

Teaching Scheme			Evaluation Scheme			
Theory	Tutorial	Practical	Mid Term	Internal	University Exam	Credits
2	0	6	100	-	200	8

### **Unit – I Multi views Representation**

1.1 First & third angle projection methods and positions of six views. 1.2 Multi view drawings (all six views) from given isometric drawing / physical object. 1.3 Missing view drawings from given adequate orthographic views.

### **Unit– II Sectional Ortho graphics**

2.1 Need of sections. 2.2 Section lines and cutting plane. 2.3 Rules for sectioning and section lines. 2.4 Types of sections- full, half, revolved, removed, partial, off-set, aligned. 2.5 Sectional view drawings from given isometrics drawing / physical object and cutting plane conditions.

### **Unit– III Projections and Sections of Solids**

3.1 Types and dimensional specifications of solids (prism, pyramid, cylinder, cone). 3.2 Projections of solids - in various positions with respect to the reference planes. (Parallel, perpendicular and inclined to HP and / or VP.) 3.3 Sectional views of different solids in given various positions. 3.4 True shape of section.

### **Unit– IV Intersection and Penetration of Solids and Surfaces**

4.1 Importance and field use. 4.2 Intersection curve for Intersection / penetration of :  
i. Prism into prism. ii. Cylinder into cylinder. iii. Cylinder into prism. iv. Cone into cylinder.

### **Unit– V Development of Surfaces**

5.1 Importance of development of surfaces. 5.2 Drawing of development of surfaces of prism, pyramid, cylinder and cone – independent, sectioned and combination

### **Unit– VI Drafting Symbols**

6.1 Machining symbol and its interpretation. 6.2 Geometrical symbols and its interpretation. 6.3 Other drafting symbols like threading, dowels, pins, ribs, bearings, etc. 6.4 Notes in drawing like heat treatment conditions, surface conditions, assembly notes, etc. (All symbols as per BIS).

### **Unit– VII Welded Joints, Piping & Duct Layouts**

7.1 Weld symbols as per BIS-813 / ASME (primary symbols & supplementary symbols). 7.2 Weld nomenclature. 7.3 Weld dimensions. 7.4 Welding drawing interpretations. (like simple heat exchangers, pressure vessels, etc.) 7.5 Pipe-types, standards and designation methods. 7.6 Pipe line symbol as per passing fluid, air, gas, water etc. 7.7 Piping fitting symbols. 7.8 Pipe line diagram. 7.9 Interpretation of Process flow diagram & piping isometrics & pipe schedule chart. 7.10 Ducts-types and applications. 7.11 Duct layout.

### **Unit– VIII Details & Assembly**

8.1 Importance and difference of these drawings. 8.2 Detail drawing from given assembly. 8.3 Assembly drawings from given details. 8.4 Preparing bill of material (part list).

### **Unit– IX Fasteners**

9.1 Detachable & permanent fasteners. 9.2 Sketches of threads (square, acme, knuckle, Internal – external threads, Left hand – right hand threads, Single & multi start threads). 9.3 Sketches of studs (cap screws, machine screws, set screws). 9.4 Sketches of bolts & nut (hexagonal, square). 9.5 Sketches of rivets (snap, pan, countersunk, conical). 9.6 Sketches of keys.

## **DE ME SEM-1 Detail Syllabus of Material Science and Metallurgy (3321902)**

Teaching Scheme			Evaluation Scheme			
Theory	Tutorial	Practical	Mid Term	Internal	University Exam	Credits
3	0	2	30	-	70	5

### **Unit – I Engineering Materials**

1.1 Types of bonds, construction and characteristics of electrovalent, covalent, coordinate, hydrogen and metallic 1.2 Intermolecular force of attraction 1.3 Molecular arrangement in solids, liquid and gases 1.4 Structure of solids i. Concept of crystalline structure. ii. Structure of metal-unit cell, BCC, FCC and HCP. iii.Examples and properties of metallic structures 1.5 Physical, chemical, electrical, electromagnetic and thermal properties of material 1.6 Solidification of metals and digital transducers i. Concept. ii. Crystal, grain, grain boundaries and dendritic solidification. iii.Effect of cooling rate on material properties. iv. Effect of grain size on properties of metal

### **Unit– II Phase Diagrams**

2.1 Equilibrium diagrams. i. Concept, definition and need. ii. Solid solution-definition, properties and examples. iii. Alloys-major elements, reasons to add and important effect on material properties. iv. Cooling curve-concept and method to plot. v. Cooling curve for pure metals and alloys. 2.2 Time Temperature Transformation curve- (TTT curve). i. Need and application. ii. Steps to construct TTT curve 2.3 Iron carbon equilibrium diagram. i. Concept, need & characteristics. ii. Definition of the terms used. iii. Plotting fundamentals.iv. Interpretation. 2.4 Heat treatment processes. i. Types of furnaces.ii. Heat treatment processes.(Annealing, normalizing, carburizing, case hardening, hardening, tempering, spheroidising, nitriding, tempering, stabilizing, etc.).Methods, parameters and changes in properties. iii. Types of quenching mediums, their properties and applications.

### **Unit– III Metallurgical Microscope**

3.1 Metallographic examination and microstructures need and importance 3.2 Principle & working of metallurgical microscope 3.3 Preparation of specimen for microscopic examinations

#### **Unit– IV Metals And Its Alloys**

4.1 Classification of metals. 4.2 Flow diagram for the production of iron and steel. 4.3 Ferrous metals i. Classification. ii. Steels-types, composition, properties, applications. (for Plain carbon steel, alloy steel including stainless steel and cast iron.) iii. Designation and coding methods according to BIS for plain & alloy steel and cast iron. iv. Designation and coding (as per BIS, ASME, EN, DIN, JIS) of plain & alloy steel and cast iron. v. Microstructure of mostly used ferrous materials-low carbon steel, alloy steel, cast iron. 4.4 Non ferrous metals i Classification. ii. Types, composition, properties and applications. (for Copper, copper alloys, Aluminum and Aluminum alloys.) iii. Designation and coding methods according to BIS . iv. Designation and coding (as per BIS, ASME, EN, DIN, JIS) of mostly used non ferrous materials. v. Microstructure of mostly used non ferrous materials- (Copper, Brass, Gunmetal, Aluminum).

#### **Unit– V Non Metallic Materials**

5.1 Introduction and classification of non metallic materials. 5.2 Classification of Polymers on basis of Thermal behavior (Thermoplastics & Thermosetting). 5.3 Properties and applications of polymers (like Polyethylene, Polypropylene, Polyvinyl chloride, Teflon, Polystyrene, Phenol formaldehyde, Acrylonitrile, Epoxy resin.) 5.4 Surface coating methods, setup, working parameters and applications using polymers. 5.5 Composites. i. Introduction of composite. ii. Characteristics of composites. iii. Constituents of composite. iv. Types and applications of composites. 5.6 Other non metallic materials-types, properties and applications. (like rubber, ceramics, refractories , insulators, abrasives, adhesives, etc). 5.7 Designation and coding of important non metallic materials as per BIS.

#### **Unit– VI Electrolysis**

6.1 Introduction 6.2 Electrolytes and Non-electrolytes. i. Types of electrolytes. ii. Construction and working of electrochemical cell. iii. Standard conditions. iv. Standard hydrogen electrodes. v. Electrochemical series, galvanic series. vi. Faraday's Laws of Electrolysis. vii. Industrial applications of electrolysis. viii. Surface coating through electrolysis-setup and working. 6.3 Corrosion-types and reasons.

#### **Unit- VII Fluid And Powder Materials.**

7.1 Classification of fluid and powder materials. 7.2 Oils. i. Types and properties. ii. Designation methods as per BIS. iii. Applications in Mechanical engineering. 7.3 Paints and varnishes. i. Definition and classifications. ii. Surface preparation and coating methods using paints and varnishes. 7.4 Powder metallurgy. i. Basic concept of powder metallurgy and its applications, merits and demerits. ii. Manufacturing process of powder coating-setup, equipment used and working

## DE ME SEM-1 Detail Syllabus of Advance Mathematics (3320003)

Teaching Scheme			Evaluation Scheme			
Theory	Tutorial	Practical	Mid Term	Internal	University Exam	Credits
2	2	0	30	-	70	4

### **Unit – I Co-ordinate Geometry**

**1 Point** : Distance Formula, Mid-point, Locus of a point  
**1.2 Straight Line** : Forms of Equation of Straight Lines : Slope Point Form, Two Point Form, Intercept Form, Parallel and Perpendicular lines  
**1.3 Circle** : Equation of Circle, Centre and radius form, Tangent and Normal and related problems.

### **Unit– II Function & Limit**

**2.1 Function** Concept and Examples, **2.2 Limit** Concept of Limit, Standard Formulae and related Examples.

### **Unit– III Differentiation & it's Applications**

**3.1 Differentiation**: Definition, Rules of, Sum, Product, Quotient of Functions, Chain Rule, Derivative of Implicit functions and Parametric functions, Logarithmic Differentiation. Successive Differentiation up to second order  
**3.2 Application**: Velocity, Acceleration, Maxima & Minima.

### **Unit– IV Integration & its application**

**4.1 Integration**: Concept, Integral of Standard Functions, Working Rules of Integration, Integration by Parts, Integration by Substitution Method, Definite Integral and its properties. **4.2 Application**: Area and Volume.

### **Unit-V Statistics**

**5.1 Measures of Central Tendency** for Ungrouped and Grouped Data : Mean, Median and Mode, **5.2 Measure of Dispersion** for Grouped and Ungrouped data : Standard deviation

## DE ME SEM-1 Detail Syllabus of basic of civil engineering (3320003)

Teaching Scheme			Evaluation Scheme			
Theory	Tutorial	Practical	Mid Term	Internal	University Exam	Credits
0	1	2	-	30	70	3

### **Unit –1 CIVIL ENGG. SURVEYING**

1.1 Surveying & leveling (its importance and types) 1.2 Necessity for leveling 1.3 Principals of surveying 1.4 Instrument/ tools used for survey and level 1.5 Various methods of finding the field survey measurements 1.6 Chain and Compass Survey 1.7 Preparations of contour sheets/ plan using survey data. 1.8 Procedure of leveling

**Unit – 2 CIVIL ENGG. DRAWING**

2.1 Types of building drawings 2.2 Abbreviation, conventions & symbols in civil drawing 2.3 Building byelaws for planning of residential building and industrial building 2.4 Planning of simple residential and industrial building

**UNIT –3 CONSTRUCTION MATERIALS**

3.1 Common construction materials such as cement, Brick, Stone, Timber, Steel and Concrete. 3.2 Properties of each materials & their acceptable standards 3.3 Quality parameters of materials 3.4 Estimations and costing for simple structure (only the material cost)

**Unit –4 MACHINE FOUNDATIONS**

4.1Criteria for machine foundation 4.2Provisions for foundation design considerations in machine foundations.4.3Factors to be considered while designing machine foundations such as type of soil 4.4Design foundations for simple machine like lathe, compression press, universal testing machine , electric power hammer etc.

BIS CODE of practice for machine foundations I.S.- 2974 - Part –I& II

**DE ME SEM-1 Detail Syllabus of Applied Mechanics(3300008)**

Teaching Scheme			Evaluation Scheme			
Theory	Tutorial	Practical	Mid Term	Internal	University Exam	Credits
3	0	2	30	-	70	5

**Unit – I Introduction**

Scalar & Vector Quantities – like force , pressure , velocity , acceleration Static & Dynamic – Kinetics & Kinematics MKS , CGS & SI units and its conversion along with FPI and Metric System

### **Unit– II Coplanar Concurrent Forces**

**Force** – units , elements , **Laws/Principles** of forces such as Principle of Superposition , Principle of transmissibility Composition & Resolution of Forces, **Resultant & Equilibrium** forces conditions of equilibrium **Analytical & graphical method** for Law of Parallelogram , Law of Triangle , Lami’s Theorems , Law of Polygon

### **Unit– III Coplanar Non-Concurrent Forces**

**Principle of Moment** Moment , Couple , , application , properties of couple , conditions of equilibrium, **types of supports**, end conditions – Hinge , free end , roller , fix , **types of loads** like point load , U.D.L , U.V.L , Couple , **Analytical method** to Evaluate reactions in statically determinate beam subjected to point load and/ or U.D.L by analytical method of solving Statically determinate beams to

### **Unit – IV Centroid & Centre of Gravity**

**First moment of area**; to find Centroid –standard shapes of I , L , Channel & T sections , axis of symmetry, **First moment of mass**; to find C.G of standard solids sections , Axis of symmetry

### **Unit – V Friction**

**Friction** , Laws of Friction , Angle of Friction , Angle of Repose, types of friction

**Application of Lami’s** theory and theory of resolution of forces , examples on friction for a block resting on horizontal plane & on inclined plane

### **Unit – VI Work, Power & Energy**

**Work** – work done , force displacement diagram , torque, work done by torque

**Power** – I.H.P and B.H.P of engine ,Equation of H.P interms of Torque and R.P.M , Engineering Problems,**Energy** – Kinetic & Potential energy and Engineering Problems

### **Unit – VII Simple Machines**

**principles of machines** to evaluate Mechanical Advantage , Velocity Ratio of simple machine **pulley blocks** , Draw Line sketch of different systems of **Simple and compound levers** ,Problems , Laws of Machines , reversible & non reversible machines