Advance Diploma in Draftsman Mechanical

Draughtsman (Mechanical) is a working art vocational trade. The duration of trade is two years with four semesters of six months each. Students are introduced to things such as making mechanical drawings, as of machines, structures, etc. sketches, references and specifications skills to translate ideas; and into detailed technical drawings showing plans, elevations and sections in blueprints which the construction crew use to create the complex and realistic sets you see on the cinema screen. The trade course is career orienting in character and they can find so many jobs in various respective areas.

Draughtsman (Mechanical) Trade Syllabus

Syllabus of Draughtsman (Mechanical) trade as prescribed by various ITIs.

Sem. I		
Sr. No.	Subjects of Study	
	Trade Practical	Trade Theory
1	Importance of trade training, List of tools & Machinery used in the trade. Health & Safety: Introduction to safety equipments and their uses. Introduction of first aid, operation of Electrical mains. Occupational Safety & Health Importance of housekeeping & good shop floor practices.	Importance of safety and general precautions observed in the in the industry/shop floor. All necessary guidance to be provided to the new comers to become familiar with the working of Industrial Training Institute system including stores procedures. Soft Skills: its importance and Job area

	Health, Safety and Environment guidelines, legislations & regulations as applicable. Disposal procedure of waste materials like cotton waste, metal chips/burrs etc. Basic safety introduction, Personal protective Equipments (PPE):- Basic injury prevention, Basic first aid, Hazard identification and avoidance, safety signs for Danger, Warning, caution & personal safety message. Preventive measures for electrical accidents & steps to be taken in such accidents. Use of Fire extinguishers.	after completion of training. Introduction of First aid. Operation of electrical mains. Introduction of PPEs. Introduction to 5S concept & its application. Response to emergencies eg; power failure, fire, and system failure.
2	Practice in using instruments. Drawing of straight and curved lines, Drawing angles, circles etc.	Nomenclature, description and use of drawing instruments & various equipments used in drawing office. Their care and maintenance
3	Layout of drawing sheet as per B.I.S. Different types of lines & their uses in drawing.	Lay out of a drawing sheet as per B.I.S. Lines and their meanings
4	Block letters & numerals. Single & double stroke ratio 7: 4, 5: 4	Type of lettering proportion and spacing of letters and words.

5	Plane geometrical construction triangle, polygons, Circles.	Terms & definitions- polygons and circles.
6	Construction of ellipse, parabola & hyperbola, construction of involutes, cycloid curves, helix & spiral.	Definition of ellipse, parabola, hyperbola, different methods of their construction. Definition & method of drawing involutes cycloid curves, helix & spiral.
7	Dimensioning technique	Terminology – feature, functional feature, functional dimension, datum dimension, principles. Units of dimensioning, system of dimensioning, Method of dimensioning & common features.
8	Projection of points and lines. Projection of plane figures.	Planes and their normal, projections.
9	Projection of solids- prism, cones, pyramids and frustums.	Projections and orthographic projection. First angle and third angle projection. Principal of orthographic projection. Projection of solids like prism, cones, pyramids and frustums in various positions.
10	Free hand sketching, practice in drawing free hand straight lines, curved lines polygons, circles, elliptical figures with	Importance of free hand sketching, machine drawing. Material and equipment required in sketching.

	irregular contour & free hand sketch of a machine part such as tool post of a Lathe. Intensive free hand sketching of m/c parts along with projection of simple machine parts in lst angle projection. Projection of machine parts drawn in the above exercise in 3rd angle projection.	
11	Scale- plain, scales, diagonal scales. Comparative scales, venire scale & scales of chords	Constructions of different types of scales, their appropriate uses, Principle of R.F, diagonal & vernier.
12	Sectional views – Different types of section.	Importance sectional views. Types of sectional views & their uses. Parts not shown in section.
13	Projection of solids, finding out the true shape surfaces cut by oblique planes.	Solution of problems to find out the true shape of surfaces when solids are cut by different cutting planes.
14	Solution of problems to find out the true shape of surfaces when solids are cut by different cutting planes.	Section lines of different materials, conventional signs, symbols & abbreviations, hatching.
15	Development of surfaces bounded by plane. Development of surfaces	Definition of development, its need in industry & different

	bounded by plane of revolution Development of an oblique cone with elliptical base etc. Development of solids intersecting each other.	method of developing the surfaces.
16	Interpenetration of two prisms with their axes intersecting at right angles. Interpenetration of cone cylinder, & pyramids intersecting each other	Definition of Intersection & interpenetration curves. Common method to find out the curve of interpenetration
17	Interpenetration of prisms with their axis intersecting at an angle. Interpenetration of cones & pyramids with their axes intersecting at an angle.	Solution of problems on interpenetration of prism, cones, & pyramids with their axes intersecting at an angle. Intersection of cylinder.
18	Isometric projection of geometrical solids.	Principle of isometric projection, Difference between Isometric drawing & Isometric projection. Isometric scale. Dimensioning an isometric drawing.
19	Isometric projection of a machine part with irregular curves. Free hand isometric drawing of actual objects. Isometric projection of a simple Journal Bearing.	Different methods of drawing Isometric views. Principle and types of oblique projection. Advantage of oblique projection over isometric projection.

20	Oblique projection of solids and machine parts perspective projection of solid.	Types of perspective projection Fundamental concept and definition, Location of station point.
Sem. II		
	Trade Practical	Trade Theory
1	Screw threads with BIS conventions (free hand sketching as well as with instruments).	Screw threads, terms nomenclature, types of screw thread, proportion and their uses, threads conventions.
2	Types of nuts and washers, with BIS Convention Types of bolts and studs with BIS convention.	Types of nuts & their proportion, uses. Types of bolts and studs, and their proportion, uses. Different types of locking devices. Different types of machine screws, cap screws, set screws and their specification.
3	Locking devices, machine screws caps screw set screw with BIS convention	Different types of foundation bolts.
4	Foundation bolts with BIS convention. Welded joints. Use of welding symbols, Working drawing of welded Structures.	Types of assembly drawing, types of detailed drawing, preparation of bill of materials. Description of Welded Joints and their representation (Actual and Symbolic) Indication of Welding Symbol on drawing as per BIS.

5	Keys, cotters, circlips and pins with BIS conventions	Purpose, terms, different types of key (Heavy duty and Light duty) and proportions use of cotters, pins and circlips.
6	Types of rivets, types of riveted joints with BIS conventions	Types of fastening materials, types of rivets, their proportions and uses. Types of riveted joints, terms and proportions or riveted joints. Conventional representation
7	To prepare working drawing of riveted structure as per conventional system	Causes of failure of riveted joint efficiency of riveted joints.
8	ALLIED TRADE- FITTING- Use of different types of fitters hand tools, use centre punch different types of files, callipers, hacksaws and hack sawing chisels, hammers	Description and application of simple measuring tools, Description of vices, hammers, cold chisel, files, etc. And proper method of using them. Method of using precision measuring instrument such as vernier height gauges
9	ALLIED TRADE TURNING Plain turning , stepped turning ,Taper turning with different method ALLIED TRADE MACHINIST, Use of jigs and fixtures Simple operations on milling machine such as plain is milling and key way cutting. Marking out castings	Safety precaution for lathes Description of parts of Lathe & its accessories. Method of using precision measuring instrument such as inside & outside micrometers, depth gauges, vernier, callipers , dial indicators, slip gauges , sine bars, universal bevel protractor,

	and forgings. Setting up and operation of shaping, slotting and planning machines	etc. Brief Description of milling shaping slotting and planning machines Quick return mechanism of these machines
10	ALLIED TRADE : SHEET METAL Use of hand tools such as planishing hammers stakes, mallet, bricks prick punch etc. Development of surfaces.	Name and brief description of common equipment necessary for sheet metal work. Different types and uses of joints employed in sheet metal work.
11	ALLIED TRADE :WELDING & FOUDRY MAN/MOULDER Use of hand tools used In Gas and in electric welding of object by gas and electric according to drawing Different types of mould, cores and core dressing, use of moulding tools.	Name and brief description of the Hand tools identification of gas cylinders. Different types of welded joints and necessary preparation required for these. Welding symbols as applied to drawing. Safety precautions, Hand tools used for molding. The description, use and care of hand tools
12	ALLIED TRADE: ELECTRIAN Familiarization with the measuring instruments machinery and panels used in electrician trade Electrical and Electronic symbols and simple wiring diagrams. ALLIED TRADE:MMV- I.C ENGINE Familiarization & Identification of different parts of i.e. Engines (Both	A.C & D.C Motors Generators of common types and their uses Names and brief description of common equipment necessary for sheet metal work Electrical units and quantities. Laws of electricity. Simple examples of calculation of current voltage, resistance in series and parallel connection (D.C.Circuit). Brief description of internal

	spark ignition & compression/ignition-2 stroke & 4 stroke engines).	combustion engines, such as cylinder block piston, carburettor spark plug, camshaft, crank shaft< injector fuel pump etc.
13	Symbols for machining and surface finishes (grades and micron values)	Limits, fit, tolerance. Toleranced dimensioning, geometrical tolerance. Indications of symbols for machining and surface finishes on rawing (grades and micron values) Production of interchangeable parts, geometrical tolerance. Familiarization with IS: 919, IS:2709
14	Working drawing of (muff coupling, flanged coupling, friction grip coupling, pin type flexible coupling, universal coupling) couplings.	Couplings, necessity of coupling, classification of couplings. Uses and proportion of different types of couplings.
15	Working drawing of couplings (oldham's coupling, claw coupling, cone friction clutch.)	Materials used for couplings.
16	Working drawing of a simple bearing and foot step bearing	Use of a bearing, types of bearing, frictional and anti frictional bearings.

17	Details and assembly drawing of Plummer block.	Material used for frictional bearings. Properties of frictional bearing (sliding bearing) materials.
18	Details and assembly drawing of self aligning bearing (swivel bearing)	Parts of anti frictional bearings (ball, roller, thrust ball, needle & taper roller) Materials and proportion of parts. Difference between frictional and anti frictional bearings. Advantages of anti frictional bearings.
19	PRACTICE ON COMPUTER Practice on two useful software via MSWord & MS Excel, MS Office & operating system	Introduction to computer, windows
20	Introduction to Auto CAD, Auto CAD main Menu, screen menu, command line, model space Drawing layouts, Tool bars, File creation, Save, Open existing drawing	Introduction to Auto CAD Advantages of using Autocad
21	Related Exercises using Absolute Coordinate system, Polar Co-ordinate System and Relative Co-ordinate System, Exercise using Line, Break, Erase, Undo commands	Absolute Co-ordinate system, Polar Co-ordinate System and Relative Co-ordinate System Create Line, Break, Erase, Undo
	In-plant training / Project work	

भारत सरकार एमएसएमई
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