

SYLLABUS FOR THE TRADE OF DRAUGHTSMAN (CIVIL)
UNDER CRAFTSMENSHIP TRAINING SCHEME

PERIOD OF TRAINING : 2 YEARS.

Week no.	Trade practical	Trade theory	Workshop calculation and science
1	<p>Induction training Familiarization with the institute. Importance of the trade training. Instruments used in the trade. Types of the work done by the trainees in the institute. Types of the jobs made by the trainee in the institute. introduction of the safety including fire fighting equipment and their uses etc.</p>	<p>Importance of the safety and the general precautions observed in the institute and in the section. importance of the trade in the Development of the industrial economy of the same of the country. What is the related instruction – subjects to be taught, achievement to be made recreational, medical facilities and the other extra activities of the institute.(all necessary guidance to be provided to the new comers to become familiars, with the working of industrial training institute. system including store procedures, professional prospects etc.</p>	

2	free hand sketching of simple geometrical objects. Use of drawing instruments and materials. Lay out of drawing sheets, drawing conventional lines according to is code. Folding of sheets.	introduction Drawing is a language of technicians, drawing office organization, drawing instruments, equipments and materials their use, care & maintenance, safely precautions. Introduction to Indian standard institution. Code of practice for general and architectural drawings.	applied trade problems-involving multiplication, division common fraction addition, subtraction, multiplication & division, application of fractions and decimals to trade problems.
3	Free hand sketching of geometrical models. Lettering and numbering, vertical & inclined.	Importance of lettering, printing of letters and figures sizes, proportion etc. as per ISI code.	-do-
4 & 5	Printing of single strike lettering both Inclined & vertical, printing of double strike lettering both Inclined & vertical, printing of name plates.	Forms and proportions for single strike lettering, lettering stencils.	Same as SI. 2 col. 4.
6.7. & 8.	Construction of plane geometrical figures (lines, angles, triangles, rhombus, quadrilaterals, polygons etc.)	Geometrical drawing. Definitions, construction of plain geometrical figures. Orthographic projection, dihedral angles and recommended methods of	Ratio and proportion in trade problems. Units-different system and conversion.

		projection according to ISI codes.	
9. & 10	Construction of ordinary scales, plain, comparative, venire & scale of chords.	Principles, representation and construction of different types of scales, graphic scales, recommended scales for drawing with reference to ISI codes.	-do- Algebra-simple equations and transposition. Problems involving trade problems, quadratic equations and problems connected to trade.
11 & 14	Drawing plan and elevation of points, lines, surfaces and solids. Dimensioning technique.	Dimensioning technique, order of finishing, technical sketching, technique of sketchier model drawing, orthographic sketching etc.	Unit of force, weight, equations of motion. Laws of motion, problems.
15 & 16	Sketching from models. Drawing orthographic sketches including dimensioning.	Conventional signs and symbols as per i.e. Bricks-characteristic of good bricks, hollow bricks and manufacture of bricks.	-do-
17 & 18	Conventional signs and symbols used in engineering drawing including conventional brakes.	Tiles, terracotta, stone ware and earthen ware. Sand types, characteristics, cement, lime.	-do- Areas of triangles, rectangles, square, circle, regular, polygons etc. and problems, logarithms.

19.20. & 21.	Showing arrangement of bricks in different parts of bonds, in walls, pillars copying, drawing of shoring.	Sequence of construction of a building. Names of different parts of building. Bricks masonry-principles of construction of bonds. Tools and equipment used scaffolding.	Areas of triangles, rectangles, square, circle, regular, polygons etc. problems, logarithms.
22. & 23	Drawing of scaffolding. Drawing details of stone masonry including stone joints.	Stone masonry terms used principles of construction, classification, composite masonry and strength of walls. Timber: structure-Indian timber uses.	Calculation on volume and weight of simple solid nodes, such as cubes, squares etc. Simpson's rule and problems.
24 & 25	Drawing different types of foundation, footing, piles, grillages, raft & well foundation.	Foundation: purpose, causes of failure of foundation, bearing capacity of soils, dead and live loads, examination of ground. Types of foundation. Drawing of footing foundation setting out of building of ground excavation, shoring & simple machine foundations.	-----do-----

26	Drawing details of damp proof courses. Plinth protection.	Dampness in building and damp proof course. Method of prevention of dampness in building. mortar-types, proportion & mixing. plastering & pointing. white washing & distempering.	Reading & plotting of simple graph. Trigonometrically ratios. Functions applied problems height and distance.
27	Drawing details of ground floors-concrete, brick on edge, tiled, timber, patent stone mosaic and steel floor.	Types of ground floor and methods of constructing granolithic, mosaic, brick tiled etc. floors.	-----do-----
28 & 29.	Drawing forms of arches, lintels and centering.	Arches-technical terms forms-brick and stone centering-lintel. Market forms and sizes.	-----do-----
30. & 31.	Making drawings of carpentry joints: lengthening, bearing, housing, framing, paneling & molding.	Carpentry joints-terms, classification of joints.	Solution of triangles stress, strain, young's modules and problems.
32. & 33.	Making detailed drawing of different types of door including paneled, glazed and flush door.	Doors: parts of door, locations, sizes, and types.	-----do-----

34.	Making detailed drawing of windows and ventilators.	Windows and ventilators: including steel windows and ventilators-fixtures and fastenings used in doors. Windows and ventilators.	Lever-types and problems. Heat and temperature-different thermometric scales. Linear expansion of solids.
35. & 36.	Drawing details of pitched roof including and queen post, roof trusses. Drawing details of a steel roof truss, showing details connections.	Roof: pitched roof types, roof covering, and component parts of roof. Theory of trussing, king and queen post trusses.	-----do-----
37. & 38.	Drawing details of upper floors, wooden floors, stone jack, arch, madras terrace and brick n0gged.	classification and construction of upper floors including water proofing, general principles of construction of masonry & RCC	Lever-types and problems. Heat and temperature-different thermometric scales, linear expansion of solids.
39. to 40.	Drawing details of brick stone wooden & steel stairs. Preparing drawings of details of parts of wooden stair. Preparing drawings of straight, open newel dog legged geometrical and bifurcated stairs & spiral stairs.	Stairs: terms, forms, materials, planning and designing of stairs. Details of construction.	Unit of hear, problems work power and energy and units. house power watt, simple problems

41. to 45.	Drawing details of single storied residential house with single room (drawing should be of both pitched and flat roof) drawing plan, elevation, section with aid of line diagrams. Lay out and detailing of a residential building.	Residential building. Principles of planning. Orientation-local building by law as including ISI code, types of residential building, rooms. Services, utilities which constitute a dwelling house estimation. Method and find out quantities for a single storied residential building.	-----do----- sound : characteristic of sound light: laws of reflection, refraction, simple problems
46. to 48.	Drawing perspective views of building including coloring and shading.	Perspective view-types. Method of construction technique of coloring and shading.	Magnetism: properties, magnetic angle, field book areas.
49. to 50.	Inking & tracing. Use of Leroy set, printing of letters. Preparing blue prints & ammonia prints.	Inking & tracing operating of Leroy set & care of its accessories. Method of preparing blue prints or ammonia prints. Folding of prints.	-----do----- Revision of all critical problems and use slide. Rule or calculator & practice.
51.	-----revision-----	---revision----	-----do-----

52.	trade preliminary test	---revision---	-----do-----
53.	Allied trade training plumbing: use of plumbing tools.	Safely precaution & elementary first aid forge and fuel. Lighting fire. Common hand tools-their description and use. Description of plumbing operations.	Finding out the surface area & volumes etc. using primordial, trapezoidal formula and also Simpson's rule.
54.	carpentry Use of carpenter's hand tools involving sawing, planing & chiseling. Marking out & marking simple joints used in doors and trusses.	Safely precautions & elementary first aid-carpenter's hand tools, their names, description and use. Common joints. Use of nails, screws, hinges, dowels etc. Preparation of glue & putty. Grinding & sharpening of tools. Their care & maintenance. Use of different types of joints. Properties and uses of different timbers used in construction work.	-----do-----
55.	wiring (electrical) Wiring in different system. Fixing and connecting appliances for domestic lighting.	Safety precautions and elementary first aid. Artificial respiration and treatment of electrical shock. Elementary electricity. General idea of	Finding out the surface area and volumes etc. using primordial, trapezoidal formula and also Simpson's rule.

		supply system. Wireman's tool kits. Wiring materials. Electric fittings. System of wiring. Wiring installation for domestic lighting.	
56. to 57.	construction of straight walls in English bond half and full brick thick with a right angled quoin, one end toothed and the other end racked back. Construction of cross walls.	safety precautions Tools their description, use and their care.	-----do-----
58.	Forming a door or window opening method of fixing door or window frame to sally with hold fast.	Details of different bending wall and section according to ISI	Finding out the surface area and volumes etc. using primordial, trapezoidal formula and also Sampson's rule.
59 & 60	Surveying of a building site with chain. Entering field book & plotting. Calculation the area of site. (Practice should also be given in measuring exiting building and producing drawing from these dimensions taken.) Surveying of a building site with plane table. Prismatic compass & its use.	Introduction. Chain surveying principles instruments employed, use, care & maintenance. Field problems. Field book. Plotting. Introduction to plane table survey. Instruments employed, use, care & maintenance. Prismatic compass. Plan meter and pantograph.	Centre of gravity moment and moment of inertia for different sections. -----do-----

61&62	<p>Handling of leveling instrument. Differential leveling. Surveying of a building site with chain & level with a view to computing earth work. Setting out level.</p> <p>Plotting of longitudinal cross-sections of a proposed road from given reduced level marking, suitable formation levels & calculation of earth work. Plotting of block & block leveling and drawing of contours.</p>	<p>Instruments and accessories their use and description level books, differential leveling. Application of chain and leveling to building construction. Plotting, preparation of contour computing earth work by spot level and contours, setting out work.</p>	-----do-----
63.	<p>Cross section showing the different types of roads.</p>	<p>Road: introduction to road, general principles of alignment. Classification and construction of different types of roads.</p>	<p>Loads various types bending moment, shearing force, cantilever & simply supported beams.</p>
64.	<p>Drawing typical cross section of rail way tracks embankment layout plans of railway platforms, marshalling yards sidings, lopping, highballing points & crossing. Electric railways track.</p>	<p>Indian railways their gauges construction of permanent ways. Different rail section. Use of stone blast in railway track. Use and types of sleepers types of signal, fixtures & fastening in railway tracks including base plates and fish plates.</p>	-----do-----

65.to 66	<p>Preparing drawing of a masonry culvert and take out various quantities of items of work & prepare abstract of cost.</p> <p>Preparing drawing of an arched bridge.</p>	<p>Bridges: introduction to bridges, component parts of a bridge. Classification of culverts. (IRC)</p>	<p>-----do-----</p>
67.	<p>Drawing of different types of irrigation structures-viz. dams, barrages, weir etc. with the help of given sketch & data. Longitudinal section of distributaries at different r.d. types of outlets and regulators.</p>	<ol style="list-style-type: none"> 1. Introduction on water resources engineering. 2. definition of terms used in irrigation and hydrology like duty delta, intensity of irrigation, hydrograph, peak flow , run off, catchments area, CCA, CCA, RABI, kharif, etc. 3. Storage/diversion structures, definitions: types of dammasonry, concrete & composite dams, gravity dam, arch and buttress dams, earth and rock fill dams. 	<p>Loads-various types bending moment, shearing force, cantilever and simply supported beams.</p>

68 & 69	-----do-----	<p>Reservoir types of reservoirs viz single purpose and multi purpose, area/capacity curves of reservoir.</p> <p>(B) canals.: canals classification of canals and distributions system canal structures viz. head regulators, cross regulators, canal outlet, escape, etc. drawing of canal alignment including longitudinal and cross sections of canals with the given data.</p>	Loads, various types bending, moment, shearing force, cantilever and simply supported beams.
70 & 71	Preparation of drawings showing various pipe joints for underground drain age, method of sanitary fittings in multistoried building. Manholes and septicktank.	Introduction-terms used in public health engineering. system of sanitation-house plumbing, sanitary fittings etc.	Problems on over-handling beams, point of contra-flexure, problems related to trade.
72. to 74.	Drawing details of RCC members. Rectangular beams lintel chajjas, slap, stair including column with footing & continuous columns showing disposition of reinforcement,	Introduction to R.C.C uses materials proportions and form work, including bending of bars and construction reference to	electricity-ohm's law parallel and series connection & problems,

	preparing bar bending, schedules. Method of floor and roof finishing.	ISI code. Reinforced brick work. materials used for rcc, construction selection of materials course aggregate, fine aggregate cement water, reinforcement, characteristics., method of mixing concrete hand and machine, slump test.	
75.	Drawing forms of rivet heads and types of riveted joints.	Forms of rivets, proportions. Types of riveted joints.	-----do-----
76. to 78.	drawing the various standard steel sections and built up sections used for girders and stanchion including compound columns and streets standard piles, steel through etc.	Introduction to structural drafting. Arrangements of drawing standard drawing practice to represent thread nuts, bolts and structural steel section. Reference to ISI code.	-----do----- Use & practices with planimeter and pantograph.
79. to 82.	Preparation of estimate for residential buildings, canals distributaries, outlets culverts & public health works.	Type designs. Building estimating. Types of estimate standard method of taking out quantity, labor & material detailed & abstract	Bending stress, simple reflection column rivet etc. problems.

		estimate. Analysis of rates for simple items of work. Schedule of rates, specifications.	
83. to 88	Preparation of the working drawings of public buildings such as rest house, hospital high school, cinema theater workshop building of an ITI tracing & blue printing.	Residential building, planning of building, local by laws including ISI code. Types of residential building rooms. Service utilities which constitute a dwelling house. building by-laws of state urban development authorities / boards improvement trust etc.	Simple estimate in connection with trade rate of analysis including RCC and RBC.
89. to 92.	<ul style="list-style-type: none"> (1) Elementary dos (disc operating system) (2) Knowledge of editor. (3) How to install AutoCAD. (4) How to load AutoCAD. (5) Elementary command of AutoCAD. (6) Knowledge window software. (7) Free hand working practice on AutoCAD. 	<ul style="list-style-type: none"> (1) What is computer? General terms used in computer. (2) Elementary dos command. (3) Word processor commands and their uses. (4) Window command and their uses. (5) Auto cad commands and use of different menus of AutoCAD. 	

93	Evolution of project work.		Deputation. Revision test.
94 to 97	Deputation to local civil engineering drawing and design offices to become familiar with the office procedures. Standards and drawings begins prepared there, or visit different drawings organization, project, site, construction work set.		-----do-----
98 to 101.	Project work –isometric view, perspective view. Light tracing, copying, valuation of new and old building.		
102 & 103.	revision
104.	f I n a l t e s t		

SR. NO.	NAME OF THE TOOLS & EQUIPMENT AS PER THE SYLLABUS	NO.REQD.FO R INSTR.& TRAINEES FOR ONE UNIT AS PER DGET NORMS.
1.	<i>BOX DRAWING INSTRUMENT CONTAINING ONE 15 CM COMPASS WITH PIN POINT, PIN POINT & LENGTHENING BAR, ONE PAIR SPRING BOWS, ROTATING COMPASS WITH INTERCHANGEABLE INK AND PENCIL POINTS, DRAWING PENS WITH PLAIN POINT & CROSS POINT, SCREW DRIVER AND BOX OF LEDS.</i>	16
2.	<i>PROTRACTOR CELLULOID 15 CM SEMI-CIRCULAR</i>	16
3.	<i>SCALE CARD BOARD-METRIC SET OF EIGHT A TO H IN A BOX 1:1,1:2,1:2:5,1:5,1:10,1:20,1:50,1:100,1:200,1:500,1:1000,1:2000, 1:1250,1:6000,1:38 1/3,1:66 2/3.</i>	16 SETS
4.	<i>SCALE - METRIC AND SECTION WOODEN 30 CM LONG MARKED WITH EIGHT SCALE – 1:1,1:2,1:2:5,1:10,1:20,1:50,1:100,1:5</i>	16 SETS
5.	<i>SCALES PLOTTING BOX WOOD 6 METRIC SCALES 30 CM LONG WITH OFF SET SCALES.</i>	16 SETS
6.	<i>SET SQUARES TRANSPARENT 2 MM THICK WITH BEVELLED EDGES 45 DEGREES 20 CM.</i>	16 SETS
7.	<i>SET SQUARE CELLULOID 2 MM THICK WITH BEVELLED EDGE 60 DEGREES 25 CM.</i>	16
8.	<i>BOARD DRAWING 1250 MM X 900 MM.</i>	16
9.	<i>SQUARE T 1250 MM</i>	16
10.	<i>ERASING SHIELD SMALL SIZE.</i>	16
11.	<i>TEMPLATE – ARCHITECTS AND BUILDERS.</i>	16
12.	<i><u>GENERAL OUTFIT</u></i>	
1.	<i>GEOMETRICAL MODELS (WOODEN) AS PER GIVEN BELOW (1) CUBE 08 MM SIDES (2) RECTANGULAR PARALLEL PIPED 8 CM X 15 CM (3) SPHERE 8 CM DIA.</i>	

	<p>(4) LIGHT CIRCULAR CORE 8 CM DIA BASE 15 CM VERTICAL HEIGHT.</p> <p>(5) SQUARE PYRAMID 8 CM SIDE BASE AND 15 CM VERTICAL HEIGHT.</p> <p>(6) CYLINDER 8 CM DIA. 15 CM HEIGHT.</p> <p>(7) PRISMS TRIANGULAR 8 CM SIDES TRIANGLE AND 15 CM LENGTH.</p> <p>(8) PRISM HEXAGONAL 8 CM SIDES HEXAGON AND 15 CM LENGTH.</p>	
2.	FRENCH CURVES-TRANSPARENT PLASTIC SET OF 12.	4
3.	FLEXIBLE CURVES 80 CM LONG.	8
4.	ELLIPTIC TRAMMEL WITH INK AND PENCIL FOR NOT LESS THAN 10 CM MINOR AXES COMPLETE IN A CASE.	1
5.	RADIUS CURVE METRIC-3 MM 15 MM.	4
6.	CLINOGRAPH WOODEN 18 CM.	1
7.	DRAFTING MACHINES- VERTICAL TYPE COMPLETES WITH DRAWING BOARD ADJUSTABLE TABLE AND PAIR OF METRIC SCALES 30 CM AND 40 CM LONG.	4
8.	DRAFTING MACHINES-HORIZONTAL TYPE COMPLETE WITH DRAWING BOARD SIZE ADJUSTABLE TABLE WITH PAIR OF METRIC SCALES 30 CMS AND 40 CMS.	4
9.	BRASS PARALLEL RULER IN A CASE	4
10.	CALCULATOR (POCKET SIZE) 1 (FX)	4
11.	PLANIMETER SLIDING BAR PATTERN 70 CM COMPLETE IN CASE WITH MAGNIFIER AND INSTRUCTIONS READING IN METRIC UNITS.	1
12.	PENTAGRAPH-BRASS-COMPLETE IN WOODEN CASE WITH ACCESSORIES 60 CMS.	1
13.	BEAM COMPASS WITH FINE ADJUSTMENTS WITH INK AND PENCIL POINTS AND TWO CHROMIUM PLATED WEIGHTS 30 CM IN WOODEN CASE.	2
14.	PROPORTIONAL DIVIDERS 15 CM.	4
15.	LERROY PRINTING SET.	2
16.	TRACING TABLE WITH PLATE GLASS 1250 X 900 CMS.	1
17.	PRINTING FRAME 45 CM X 60 CM & 80 CM X 60 CM	1
18.	WEIGHTING TRIANGLE WITH TAPE 1250 X 900 CMS.	2
19.	AMMONIA BOX 120 CM X 35 X 35 CMS.	1

20.	<i>STENCILS – COMPLETE SET 6 H.</i>	<i>2 SETS.</i>
21.	<i>TABLE DRAFTING FOR BOARDS</i>	<i>2 SETS.</i>
22.	<i>STOOLS DRAUGHTSMAN HIGH</i>	<i>2 SETS</i>
23.	<i>TABLE WORKING BLUE PRINTING 2 M X 10 M.</i>	<i>2</i>
24.	<i>PC-AT FOR AUTO CAD WITH PLOTTER & DOT-MATRIX PRINTER.</i>	<i>2 NOS.</i>
25.	<i>ALMIRAH STEEL (MAJOR)</i>	<i>2</i>
26.	<i>INTERLOCK, INTERCHANGEABLE BRASS STENCILS WITH BRUSH IN A BOX.</i>	<i>4</i>
27.	<i>PASTLE AND MORTAR-PORCELAIN 3 MM,6 MM, 12MM, 18MM.</i>	<i>2</i>
28.	<i>PRINT TRIMMER CUTTING EDGE 100 CM.</i>	<i>1</i>
29.	<i>CHEST OF DRAWERS 8 DRAWERS (STANDARD).</i>	<i>4</i>
30.	<i>DRAUGHTSMAN TABLE.</i>	<i>16</i>
31.	<i>DRAUGHTSMAN STOOL.</i>	<i>16</i>
32.	<i>INSTRUCTOR'S TABLE (BIG SIZE, FULL SECRETARIATE)</i>	<i>1</i>
33.	<i>INSTRUCTOR CHAIR.</i>	<i>2</i>
	<i>SURVEY INSTRUMENTS</i>	
1.	<i>LAND MEASURING CHAIN 30 METRES WITH 10 ARMS.</i>	<i>4</i>
2.	<i>STEEL TAPE 20 METRES LONG IN A LEATHER CASE.</i>	<i>2</i>
3.	<i>RANGING RODS WOODEN FITTED WITH IRON SHOE 2 METERS LONG.</i>	<i>16</i>
4.	<i>OPTICAL SQUARE PWD PATTERN</i>	<i>4</i>
5.	<i>OPTICAL SQUARE BOX TYPE CIRCULAR.</i>	<i>1</i>
6.	<i>DUMPY LEVEL-BUILDER 25 CM LOCAL LENGTH X 23 MM COMPLETE WITH BOX AND ACCESSORIES AND STAND.</i>	<i>2</i>
7.	<i>LEVELLING STAFF 4 METERS READING TO 5 MM.</i>	<i>1 TELESCOPIC</i>
8.	<i>PLAIN TABLE WITH STAND</i>	<i>2 ST.PIECE</i>
9.	<i>ALIDEDE</i>	<i>2</i>

10.	<i>THROUGH COMPASS.</i>	
	<i>LIST OF TOOLS FOR ALLIED TRADE TRAINING IN CONSTRUCTION WORKS ETC.</i>	
1.	<i>SHOVEL</i>	2
2.	<i>PAN M.S. 25 CMS DIA.</i>	6
3.	<i>FARMA WOODEN FOR MEASURING AGGREGATES</i>	1
4.	<i>BUCKET G.I. 35 CM DIA.</i>	4
5.	<i>MASON'S PLUMB RULE WITH SPIRIT LEVEL</i>	4
6.	<i>MASON'S SQUARE 30 CM X 30 CM.</i>	4
7.	<i>SIEVE FOR SAND 1 MM/100 X 60 CM</i>	1
8.	<i>TROWEL 25 CM X 10 CM.</i>	4
9.	<i>SIEVE FOR SAND 22 MM/100 X 60 CMS.</i>	1
10.	<i>TOOLS CAULKING SET CB 6</i>	2 SETS
11.	<i>BRICK HAMMER WITH HANDLE</i>	4
12.	<i>RULE 4 FOLD WOODEN 60 CMS.</i>	4
13.	<i>6" PAINTING TROWEL</i>	4
14.	<i>LINE PINS CORNER BLOCK</i>	4 PAIR EACH
15.	<i>MOTOR BOARD</i>	4
16.	<i>WIRE BRUSH</i>	4
17.	<i>WOODEN FLOAT</i>	4
18.	<i>STEEL FLOAT</i>	4
19.	<i>SPIRIT LEVEL 30 CMS.</i>	4
20.	<i>CHISEL 5 CM HAMMER HEADED</i>	4
21.	<i>BOLSTER</i>	4
22.	<i>CLAW HAMMER</i>	4
23.	<i>SPADE</i>	4

24.	<i>MEASURING TAPE STEEL 30 METERS.</i>	<i>4</i>
25.	<i>LADDER ALUMINIUM 3 METERS.</i>	<i>4</i>
26.	<i>PICKAXE</i>	<i>2</i>
27.	<i>HAMMER 250 GMS.</i>	<i>1</i>
28.	<i>CROW BAR 3 CM DIA. 1.5.LAG</i>	<i>2</i>
29.	<i>HANDS HAMMER 1 KG.</i>	<i>2</i>
30.	<i>BINACULARS</i>	<i>2</i>
31.	<i>SURVEYOR'S UMBRELLA</i>	<i>2 NOS.</i>