7. TRADE SYLLABUS

SYLLABUSFOR MASON (BUILDING CONSTRUCTOR) TRADE			
Duration – One Year			
Duration	**Reference Learning Outcome**	**Professional Skills (Trade Practical) With Indicative Hours**	**Professional Knowledge (Trade Theory)**
Professional Skill 100 Hrs; Professional Knowledge 28 Hrs	Perform wood work with carpenter's tools following safety precautions.	1. Familiarization with Institute, administrative setup of Institute. (3 hrs.) 2. Rules & resolutions of attendance with leave facility. (3 hrs.) 3. Importance of Trade training, instruments & equipment's used. (5 hrs.) 4. Importance of trade training, List of tools & Machinery used in the trade.(4 hrs.) 5. Safety attitude development of the trainee by educating them to use Personal Protective Equipment (PPE). (5 hrs.) 6. First Aid Method and basic training. (4 hrs.) 7. Safe disposal of waste materials like Pieces of wood, rod, stone, mud, etc. (2 hrs.) 8. Hazard identification and avoidance. (2 hrs.) 9. Safety signs for	• Importance of safety and general precautions required for the trade. • Importance of the trade. • Types of work to be done by trainees in the institute. • Scope of a mason work. • Types of services has to plan. • Role of a mason, nature of job done by masons(14 hrs)

		Danger, Warning, caution & personal safety message. (3hrs.) 10. Preventive measures for electrical accidents & steps to be taken in such accidents. (5 hrs.) 11. Use of Fire extinguishers. (9 hrs.) 12. Practice and understand precautions to be followed while working in mason jobs. (3 hrs.) 13. Safe use of tools and equipments used in the trade. (2 hrs.)	
		Carpenter works :- 14. Demonstrate uses of Carpenter's hand tools. (10 hrs.) 15. Perform operations such as marking, sawing, planning chiselling, drilling etc. grinding of tools. (8 hrs.) 16. Perform simple carpentry joints and make simple wooden object like, box, stool, etc. (16 hrs.) 17. Centering work. Uses of nails, screws, nuts & bolts, hinges etc. (7 hrs.) 18. Perform centering & form work. (9 hrs.)	• Common types of wood- their description and use. • Carpenter's hand tools, their names and uses. Grinding of tools &precautions to be taken • Carpentry joints and their uses. Use of nails, screws, dowels, etc.(14 hrs)

Professional Skill 150 Hrs; Professional Knowledge 42 Hrs	Plan and organize the work to make masonry brick wall as per drawing and specification applying different types of tools, materials and check for dimensional accuracy.	19. Handling of brick, turning of brick for stretcher & header faces. (4 hrs.) 20. Cutting of brick with brick hammer as desire shape & size. (8 hrs.) 21. Shaping mortar, spreading on the bed joining bricks. (10 hrs.) 22. Preparation of various types of mortars according to the ratio ofingredients. (6 hrs.) 23. Building $4\frac{1}{2}$" straight wall about 6courses high with one end stepped and the other racked back. (24 hrs.) 24. Building $4\frac{1}{2}$" quoin wall with oneend stepped and the other racked back. Use of plumb rule. (26 hrs.) 25. Construct of 1 &1 ½ brick walljunctions in English & Flemishbonds. Racking out the joints &finishing it flush. (24 hrs.) 26. Construction of 1 brick thick walls inEnglish & Flemish garden bonds. (24 hrs.) 27. Construct of detached brick pillars with footings square & rectangular	• Technical terms used in brick masonry. Necessity of bonding bricks. Types of bond Types of mortars, different grades of sand for brick work & plastering. Grades of cement. • Brickwork-racking back & toothing. Differences between English & Flemish bonds. Details of English & Flemish bond for 1 and $1\frac{1}{2}$ brick walls. Precautions at quoins. • Cross wall-method of construction. Grouting of mortar, jointing and finishing of brickwork. Types of pointing & tools used. Details of bonding & special precautions at 'T', 'L' and cross junctions. Types of copings-weathering & throating. • Pillars: Necessity, types, relation between cross section & height. Details of reinforcement for square &rectangular pillars. • Types of cement, sand & lime. English

		types. (24 hrs.)	&Flemish garden wall bonds. PWD specification on brickwork. • Foundation: Definition, purpose, types,important terms, causes of failure of foundations. • Hollow blocks: Glazed, sand, lime bricks.Uses, merits & demerits.(42 hrs)
Professional Skill 25 Hrs; Professional Knowledge 07 Hrs	Construct wall leaving space for door & window opening.	28. Form a door opening in a wallofEnglish bond. Bonding of jambs & reveals. (10 hrs.) 29. Form a window opening in awall in English bond. (7 hrs.) 30. Construction of sill with overSailingcourses. Use of gauge rodFixing door & window frames. (8 hrs.)	• Purpose of arch centering& form work. Different types of bricks &theirsizes.Characteristics of good bricks Sizes of mortar joints for different works. Stretcher & header • Construction of sill with oversailing courses-gauge rod-its purpose. Method offixing door & window frames. Hold fasts &dowels-purpose and method of fixing. PWDspecification on the above.(07 hrs)
Professional Skill 50 Hrs; Professional Knowledge 14 Hrs	Perform R.C.C casting, rod cutting in different sizes, bending, binding & placing. Mixing & compaction	31. Demonstrate R.C.C, re-enforcement of different dia. With unit weight. Cutting, bending & binding of bar. (4 hrs.) 32. Perform Pre-casting a lintel-compacting, curing & setting the same in	• RCC lintels: Materials required, • method of construction, precast lintels, • method of construction of formwork, details of reinforcement. • Arches: Purpose,

	of Concrete with different proportions.	position. Check for equal bearing. (8 hrs.) 33. Spanning of opening by casting alintel in site. (10 hrs.) 34. Making of shuttering &supports with uprights and wedges. (7 hrs.) 35. Cutting, bending & placing ofreinforcement. (4 hrs.) 36. Mixing, placing & compacting concrete. (2 hrs.) 37. Spanning of opening with a semi-circular arch, making centering, cutting of templates for voussoirs & preparing voussoirs, setting uprights of arch. Construction of arch &removing centering. (15 hrs.)	technical terms & types. Setting out an arch. • Tummel & template for preparing voussoirs& keybricks. • Method of constructing centering for an arch.(14 hrs)
Professional Skill 25 Hrs; Professional Knowledge 07 Hrs	Perform Construction of cavity wall.	38. Construct cavity walls, setting out both leaves, provision of wall ties and use of cavity rods. (25 hrs.)	• Cavity wall: Technical terms, advantages,constructional details, precautions to be taken at the bottom of cavity. • Provision of weep holes & ties, special care at junctions & openings.(07 hrs)
Professional Skill 50 Hrs;	Perform Laying out of building plan, diagonal check-up, fixing	39. Setting out a building: Obtaining first,second, third & fourth lines, marking diagonals,	• Steps in setting out & marking centre line, excavation line & other lines-use of deadman-

Professional Knowledge 14 Hrs	up of excavation lines	setting out cross walls & offsets. (30 hrs.) 40. Marking excavation lines & fixingof plinth & floor levels. (20 hrs.)	checking accuracy & precautions. Windows & ventilators: Including steel windows & ventilators, fixtures &fastenings used.(14 hrs)
Professional Skill75 Hrs; Professional Knowledge 21 Hrs	Perform wall & ceiling plastering with application of mortar, smoothening the surface by using of screeds & floats.	41. Plastering of walls-setting of spots-applying mortar-use of screeds &floats. (30 hrs.) 42. Fixing of screeds to soffits of door & window openings-reversing the screeds & squaring. (20 hrs.) 43. Plastering of ceiling: Application of mortar, strengthening and finishing (Improvise a roof with stone orconcrete slab for the purpose ofdemonstration). (25 hrs.)	• Plastering: Tools used, necessity of screeds& their fixing, • Steps in plastering. • Concrete: Ingredients, selection ofmaterials, various ratios of mix, their uses, measuring of materials for mixing. • Moulding: Types, purposes, making & using a mould. • Architectural terms used in connection with classical mouldings such as architrave, apex, etc. Hand & machine mixing of concrete-laying and curing of concrete. Water-cement ratio. PWD specifications.(21 hrs)
Professional Skill 50 Hrs; Professional Knowledge 14 Hrs	Make different types of floor with determination and formation of Slope.	44. Flooring practice: Determination and formation of slope, application of slurry for finishing, setting out of skirting, formation of spots for skirting. (30 hrs.) 45. Use of screeds,	• Floors: Types, constructional details such as consolidation of bed, sand filling, concrete base & finishing. Granolithic flooring. Local Municipal byelaws. • Tiles for roofing

		formation of curve atthe junction of skirting & floor. (20 hrs.)	&flooring. Purpose of wetting bricks & tiles before use.(14 hrs)
Professional Skill 100 Hrs; Professional Knowledge 28 Hrs	Lay drain pipe, jointing, fittings& fixing of W.C. pan, urinals, gully trap. Construction of manhole etc.	46. Drainage: Set out a drainagelineincluding position of manhole& gully trap. (22 hrs.) 47. Practice in setting up and reading ofdumpy level. (16 hrs.) 48. Lay out drainage to required gradients with the help of dumpy level and/or boning rod and layingits surface with bricks. (26 hrs.) 49. Laying of concrete foundation fordrainage pipes and jointing. Checking of alignment. Cutting thepipe to the required length. (10 hrs.) 50. Covering of drain pipe with concrete as per PWD specification. (4hrs.) 51. Laying out foundation concrete andconstruction of manhole. (12hrs.) 52. Method of providing footrests, Formingofdrain and benching.(10 hrs.)	• Purpose of drainage, different systems, their advantages & disadvantages, method of collection, carriage & final disposal of wastage, various types of constructions required. Roofs: Classification, parts, trussed roof, covering materials. • House drainage system-normal layout of drainage. • Traps-gully, nahani, etc.-their description. • Purpose & method of fixing sanitary fittings such as WC, urinal, washbasin, kitchen sink, etc. • Construction of surface drains and laying its surface with bricks. • Drainage pipes: Types, materials, sizes, gradient for different diameters, method of laying & jointing, importance of water tightness, concrete base and covering. • Manhole: Standard sizes, necessity, details of construction and benching. Provisions of footrests, drops & cover.(28 hrs)
	Construct septic	53. Construct Septic tank conforming PWD norms,	• Septic tank: Purpose, parts and method of

Professional Skill 50 Hrs; Professional Knowledge 14 Hrs	tank. Perform fixing& fittings of wash basin, flushing cistern, sink, vent pipe, etc.	Bonding &waterproofing of tank walls, lining field drains with bricks. Shoring for deep trenches following proper Safety precautions. (30 hrs.) 54. Fix brackets for washbasinand flushing cistern. (06 hrs.) 55. Fix WC pan, kitchen &bathroom traps, sinks, etc. Fixingof vent pipe to walls.(14hrs.)	construction. • Bonding &waterproofing of tank walls. • Method of lining field drains with bricks. Shoring for deep trenches. Safety precautions.(14 hrs)
Professional Skill 50 Hrs; Professional Knowledge 14 Hrs	Construct stone wall with cutting, chamfering, beveled etc.	56. Stonework - method of cutting stonein required size from a block. (8hrs.) 57. Selection of face &bed.(1 hr.) 58. Construct stone wall:Ashlar masonry. Types of joint used in ashlar such as chamfered, bevelled, etc. through stones & bond stones.(16 hrs.) 59. Construct a rubble masonry wall. (15 hrs.) 60. Construct compound wall withattached piers and coping.(10hrs.)	• Stone masonry: Importance of stone, conversion & dressing. • Types of dressing as per ISI specification. Types of stone. • Ashlar masonry. Types of joint used in ashlar such as chamfered, beveled, etc. through stones & bond stones.(14 hrs)
Professional Skill 50 Hrs; Professional Knowledge 14 Hrs	Lay marble on floor& stair with marking, cutting &complete setting.	61. Marble work: Method of cutting and setting on stair, floor, wall &pillar. (50 hrs.)	• Marble floor: types, constructional details. Construction of attached piers & buttresses.(14 hrs)
Professional Skill 50 Hrs;	Construct circular brick wall & hollow block walls.	62. Construct a $4\frac{1}{2}$" dia. X 9" thick circular brick wall 4 layers. (20 hrs.) 63. Construct circular gate pillars with Brick / stone/	• Circular walls: Details of construction. Purpose-made bricks. • Setting out and construction of circular gate pillars with

Professional Knowledge 14 Hrs		tile/ concrete. (16 hrs.) 64. Construct hollow block walls. (14 hrs.)	brick/stone/tile/concrete. • Hollow block masonry: Laying of hollow blocks for walls & columns. • Use of structural clay tile for partition. • Precast concrete partition, metal lathe partition and concrete block partition.(14 hrs)
Professional Skill 75 Hrs; Professional Knowledge 21 Hrs	Prepare & mix of concrete, formwork, cutting & bending of bar, casting of roof slab, beams, lintels, stair, column etc.	65. Construct roof withprefabricated hollow blocks of beams and slabs.(75 hrs.)	• Introduction to RCC: Uses, materials, properties and formwork, bending of bars & construction. • Reference to ISI code. Reinforced brickwork. • Brief description of slabs, beams, lintels, stairs, columns, etc. • RCC work: Mixing of concrete. • Laying, compacting &Curing of concrete. • Thumb rule for percentage of reinforcement for lintels, slabs, beams & columns. • Necessity hook & cranking. Shear reinforcement.(21 hrs)
Professional Skill 50 Hrs; Professional Knowledge 14 Hrs	Cut & set glazed tiles to walls.	**Finishing works :** 66. External/internal wall finishingpracticeby plastering or Pointing. (20 hrs.) 67. Fixing cement concrete jelly.(3 hrs.) 68. Laying of glazed tiles.(18 hrs.)	• Types of external & internal finishes such as rough cast, pebble, dash and stucco-materials used. • Method of finishing-factors to be kept in mind, PWD specification on the above. • Use of glazed tiles for

		69. Fixing the thread, filling betweenends,plumbing, setting out a jamb,bonding.(6 hrs.) 70. Marking & cutting tiles.(3 hrs.)	wall facing, steps in fixing, precautions. • Construction & expansion joints-method of filling-repair of cracks.(14 hrs)
Professional Skill 50 Hrs; Professional Knowledge 14 Hrs	Lay mosaic, terrazzo & tile flooring. Perform Construction of R.C.C. & Brick stairs	71. Flooring: Mosaic, terrazzo, and tileflooring. (30 hrs.) 72. Laying out a stair on the ground.(20 hrs.)	• Stairs: Technical terms, relation between tread & rise, • Types of stairs, construction details of brick, stone & RCC stairs. • Spiral stairs with precast concrete steps. • Formwork & shuttering-their removal-precautions-PWD specifications.(14 hrs)
<u>In plant training/ Project work</u> **Broad areas:** a) Install a W.C. pan. b) Construct of a circular brick wall c) Construct a manhole. d) Set glazed tiles on wall.			