



GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT & ENTREPRENEURSHIP
DIRECTORATE GENERAL OF TRAINING

COMPETENCY BASED CURRICULUM

MASON (BUILDING CONSTRUCTOR)

(Duration: One Year)

CRAFTSMEN TRAINING SCHEME (CTS)

NSQF LEVEL- 4



SECTOR – CONSTRUCTION, CONSTRUCTION MATERIAL & REAL ESTATE

MASON (BUILDING CONSTRUCTOR)



CRAFTSMEN TRAINING SCHEME (CTS)

NSQF LEVEL- 4

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Developed By

Ministry of Skill Development and Entrepreneurship
Directorate General of Training
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1. COURSE INFORMATION

During the one year duration a candidate is trained on subjects Professional Skill, Professional Knowledge, Engineering Drawing, Workshop Science & Calculation and Employability Skills. In addition to this a candidate is entrusted to make/do project work and Extra Curricular Activities to build up confidence. The practical skills are imparted in simple to complex manner & simultaneously theory subject is taught in the same fashion to apply cognitive knowledge while executing task. The practical part starts with basic constructional work viz. cutting of bricks / stones, Masonry (brick/stone), Cutting of rods, R.C.C work, etc. and finally to constructing building, finishing work, centering shuttering for R.C.C beams, column, lintels etc. at the end of the course. The broad components covered under Professional Skill subject are as below:

1st Semester - The practical part starts with basic constructional parts (Masonry) and the candidate imparted training on allied trades viz., carpenter (which leads to multi-skilling). In the basic carpentry the skills imparted are marking, sawing, Planning, chiseling, measurement, drilling, grinding of tools and observation of all safety aspects is mandatory. The safety aspects covers components like OSH&E, PPE, Fire extinguisher, First Aid etc. Masonry deals with making masonry brick wall as per drawing leaving space for door & window opening, Preparation of R.C.C casting, Construction of cavity wall, Laying out of building plan, diagonal check-up, fixing up of excavation lines, Wall & ceiling plastering, Making of different types of floor determining and Formation of Slope.

2nd Semester - In this semester laying of drain pipe, jointing, fittings & fixing of W.C. pan, urinals, gully trap. Construction of manhole etc., Construction of septic tank, Fixing & fittings of wash basin, flushing cistern, sink, vent pipe, etc., Construction of stone wall, Laying of marble on floor & stair, Construction of circular brick & hollow block walls, Preparing & mixing of concrete, formwork, casting of roof slab, beams, lintels, stair, column etc., cutting & setting of glazed tiles to walls, Laying of mosaic, terrazzo & tile flooring, Construction of R.C.C. & Brick stairs are being taught in the practical.

Professional Knowledge subject is simultaneously taught in the same fashion to apply cognitive knowledge while executing task. In addition components like Physical properties of materials, different types of constructional materials such as bricks, properties of good bricks, various types of cement with their properties, types of bonding in masonry work, foundation related knowledge, about R.C.C are also covered under theory part.

Projects need to be completed by the candidates in a group. In addition to above components the core skills components viz., Workshop calculation & science, Engineering drawing, employability skills are also covered. These core skills are essential skills which are necessary to perform the job in any given situation.

2. TRAINING SYSTEM

2.1 GENERAL

The Directorate General of Training (DGT) under Ministry of Skill Development & Entrepreneurship offers a range of vocational training courses catering to the need of different sectors of the economy/ labour market. The vocational training programs are delivered under the aegis of National Council of Vocational Training (NCVT). Craftsman Training Scheme (CTS) and Apprenticeship Training Scheme (ATS) are two pioneer programs of NCVT for propagating vocational training.

Mason (Building Constructor) trade under CTS is one of the popular courses delivered nationwide through network of ITIs. The course is of one year (02 semester) duration. It mainly consists of Domain area and Core area. The Domain area (Trade Theory & Practical) impart professional skills and knowledge, while Core area (Workshop Calculation science, Engineering Drawing and Employability Skills) impart requisite core skills, knowledge and life skills. After passing out the training program, the trainee is awarded National Trade Certificate (NTC) by NCVT which is recognized worldwide.

Broadly candidates need to demonstrate that they are able to:

- Read & interpret technical parameters/document, plan and organize work processes, identify necessary materials and tools;
- Perform task with due consideration to safety rules, accident prevention regulations and environmental protection stipulations;
- Apply professional skill, knowledge, core skills & employability skills while performing jobs.
- Document the technical parameters related to the task undertaken.

2.2 CARRIER PROGRESSION PATHWAYS

- Can join Apprenticeship programme in different types of industries leading to National Apprenticeship certificate (NAC).
- Can join Crafts Instructor Training Scheme (CITS) in the trade for becoming instructor in ITIs.

2.3 COURSE STRUCTURE

Table below depicts the distribution of training hours across various course elements during a period of one year (02 semesters):-

S No.	Course Element	Notional Training Hours
1	Professional Skill (Trade Practical)	1050
2	Professional Knowledge (Trade Theory)	252
3	Workshop Calculation & Science	84
4	Engineering Drawing	126
5	Employability Skills	110
6	Library & Extracurricular activities	58
7	Project work	160
8	Revision & Examination	240
	Total	2080

2.4 ASSESSMENT & CERTIFICATION

The trainee will be tested for his skill, knowledge and attitude during the period of the course and at the end of the training program as notified by the Government of India (GoI) from time to time. The employability skills will be tested in the first two semesters itself.

a) The **Internal Assessment** during the period of training will be done by **Formative Assessment Method** by testing for assessment criteria listed against learning outcomes. The training institute has to maintain an individual trainee portfolio as detailed in assessment guideline. The marks of internal assessment will be as per the template (Annexure – II).

b) The final assessment will be in the form of summative assessment method. The All India Trade Test for awarding NTC will be conducted by NCVT at the end of each semester as per the guideline of Government of India. The pattern and marking structure is being notified by Govt. of India from time to time. **The learning outcome and assessment criteria will be the basis for setting question papers for final assessment. The examiner during final examination will also check** the individual trainee's profile as detailed in assessment guideline before giving marks for practical examination.

2.4.1 PASS REGULATION

The minimum pass percentage for practical is 60% & minimum pass percentage of theory subjects is 40%. For the purposes of determining the overall result, 50% weightage is applied to the result of each semester examination.

2.4.2 ASSESSMENT GUIDELINE

Appropriate arrangements should be made to ensure that there will be no artificial barriers to assessment. The nature of special needs should be taken into account while undertaking the assessment. Due consideration should be given while assessing for teamwork, avoidance/reduction of scrap/wastage and disposal of scrap/waste as per procedure, behavioral attitude, sensitivity to the environment and regularity in training. The sensitivity towards OSHE and self-learning attitude are to be considered while assessing competency.

Assessment will be evidence based comprising the following:

- Job carried out in labs/workshop
- Record book/ daily diary
- Answer sheet of assessment
- Viva-voce
- Progress chart
- Attendance and punctuality
- Assignment
- Project work

Evidences of internal assessments are to be preserved until forthcoming semester examination for audit and verification by examining body. The following marking pattern to be adopted while assessing:

Performance Level	Evidence
(a) Weightage in the range of 60%-75% to be allotted during assessment	
For performance in this grade, the candidate should produce work which demonstrates attainment of an acceptable standard of craftsmanship with occasional guidance, and due regard for safety procedures and practices	• Demonstration of good skill in the use of hand tools, machine tools and workshop equipment. • Below 70% tolerance dimension achieved while undertaking different work with those demanded by the component/job. • A fairly good level of neatness and consistency in the finish. • Occasional support in completing the project/job.
(b) Weightage in the range of 75%-90% to be allotted during assessment	
For this grade, a candidate should produce work which demonstrates attainment of a reasonable standard of craftsmanship, with little guidance, and regard for safety procedures and practices	• Good skill levels in the use of hand tools, machine tools and workshop equipment. • 70-80% tolerance dimension achieved while undertaking different work with those demanded by the component/job. • A good level of neatness and consistency in the finish.

	• Little support in completing the project/job.
(c) Weightage in the range of more than 90% to be allotted during assessment	
For performance in this grade, the candidate, with minimal or no support in organization and execution and with due regard for safety procedures and practices, has produced work which demonstrates attainment of a high standard of craftsmanship.	• High skill levels in the use of hand tools, machine tools and workshop equipment. • Above 80% tolerance dimension achieved while undertaking different work with those demanded by the component/job. • A high level of neatness and consistency in the finish. • Minimal or no support in completing the project.



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3. JOB ROLE

Bricklayer, Construction; Brick Mason lays brick with mortar, and other construction material to construct and repair building walls, arches, chimneys, floors, pillars and other structures. Receives instructions regarding nature and type of work to be done. Directs Labourers to prepare mortar in required proportions and water bricks. Spreads mortar by trowel over foundation or laid bricks and lays bricks by hand in horizontal rows or designs and shapes per approved specification. Taps bricks with trowel to embed them firmly in mortar and ensures correct vertical and horizontal alignment of brick setting by sight or with string and plumb bob. Closes gaps in between bricks by filling with half bricks and mortar and by tapping with trowel. Fixes wooden frames, lay lime concrete over roofing and sets girders in position. May dismantle masonry for reconstruction or facility of work. May do plastering, decoration pointing and repair work. May erect scaffolding.

Helper Mason; needs to support Assistant Mason and Mason which are at level-2 and level-3 in semi-skilled and skilled category for carrying out the related works such as shifting of materials, handling tools, tackles and housekeeping. The responsibilities include site development and clearance, provide support for laying of bricks and blocks, mortar and cement concrete mixing, rendering coat plastering, help in setting and layout, knowing importance of scaffolding and have the basic knowledge in the environment, health, safety pertaining to the trade.

Plumbing Mason; is responsible for making masonry manholes, laying pipes in masonry works and other earth work related to plumbing.

Paviour; lays bricks and stone on leveled ground to make floors, pavements, streets etc. Receives instructions regarding type of pavement, floor or street to be laid and other specifications and collects materials required. Directs Labourers to level surface for laying bricks and stones for required construction. Lays stone slabs or bricks in line on levelled ground, by sizing them if necessary with brick hammer and trowel and tapes them to get set firmly in position. Checks alignment while laying using straight edge and spirit level and fills gaps in between with chips, bricks bits, cement etc.; May do pre-stressed and R.C. (reinforced concrete) work.

Assistant Mason; needs to work as semiskilled category tradesman and perform tasks under instruction and close supervision of Mason Level-3 as Assistant Mason. He is expected to carry out the setting and layout, laying of bricks and blocks, rendering coat plastering, finishing of concrete, fixing doors and windows in a room/cubical while effectively engaging and supervising the Helper Mason under him for all trade relevant tasks. He should ensure trade specific compliance to environment, health and safety aspects

Assistant Shuttering Carpenter; works as semi-skilled category tradesman and performs tasks under instructions and close supervision of Shuttering Carpenter Level-3 as an Assistant Shuttering Carpenter. He is expected to make, assemble, erect and dismantle Conventional/system formwork for all type of in situ and pre-cast RCC work, reading drawings, setting and layout. He should ensure trade specific compliance of environment, health, safety aspects and should engage and supervise the Helper Shuttering Carpenter under him for all relevant tasks.

Concrete Placers, Concrete Finishers and Related Workers; erect reinforced concrete frameworks and structures, make forms for moulding concrete, reinforce concrete surfaces, cement openings in walls or casings for wells, finish and repair cement surfaces.

Plasterer; plasters walls, ceilings and other surface of structures with cement, lime, mud or other mortar using hand trowel, level etc. Mixes sand, cement, lime brick powder etc. in required proportion adding water to it to prepare plastering mortar. Wets structure to be plastered with water to ensure proper adherence; spreads plaster with trowel to give preliminary coating. Levels and smoothens primary coat of plaster with straight edge, shapes borders to guide second coating and scratches surface of primary coat to provide bond for subsequent coating. Plasters area to be covered with primary coat and allows it to set for some time ensuring that it does not get dry before final coating. Applies thin layer of finish plastering coat over surface, makes out corners and angles to suit it and smoothens plastered area with straight edge and trowel. Directs and supervises sprinkling of water for curing during plastering and watches drying and final outcome of surface. May undertake ornamental plastering.

Stone Mason; Stone Setter/Stone Fixer builds stone walls, pillars and other structures by sizing and setting dressed or undressed stones. Receives instructions regarding nature and type of work to be done. Cuts stones to required size prior to setting by chipping with chisel and other cutting tools and gets them dressed or dresses them if necessary. Gets mortar prepared by labourers and spreads it with trowel bit by bit over area where stones are to be fixed. Fixes stones manually one by one in position and sets them by tapping with hammer. Checks vertical and horizontal alignments of set stones with plumb bob, ensures correct setting by alterations if necessary and fills in gaps in between stone slabs with stone chips and mortar. Removes excess mortar with trowel to smoothen joints and stones to raise structure as required. May dismantle masonry and reset girders if necessary. May do plastering, repairing and ornamental work. May lay stones on levelled ground to construct floors pavements, streets, etc. May erect scaffolding for construction work.

Tile Setter; Tile Layer fits and sets tiles to walls, floors and ceilings of buildings according to specified design using cement or other mortar and hand tools. Receives instructions regarding specifications, layout and material to be used. Soaks tiles in water to prepare them for setting. Applies mortar or cement coat over wall with trowel and lays tiles aligned in rows according to pattern. Checks alignment of tiles laid with straight edge, levelling hoard, spirit level etc., makes adjustments if necessary and taps them with trowel handle to get them set firmly. Sprinkles dry cement over freshly laid concrete for laying floor tiles and ensures proper bond between cement and tiles while laying. Cuts and shapes tiles for corner pieces, fills gaps with cement as necessary and ensures proper joining setting and alignment. May erect scaffolding for setting ceiling tiles.

Reference NCO-2015:

- a) 7112.0200 - Bricklayer, Construction
- b) 9313.0301 - Helper Mason
- c) 7112.0201 - Plumbing Mason
- d) 7112.0400 - Paviour

- e) 7112.0601 - Assistant Mason
- f) 7115.0201 - Assistant Shuttering Carpenter
- g) 7114.9900 - Concrete Placers, Concrete Finishers and Related workers
- h) 7123.0100 - Plasterer
- i) 7112.0100 - Stone Mason
- j) 7122.0100 - Tile Setter



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4. GENERAL INFORMATION

Name of the Trade	Mason (Building Constructor)
NCO - 2015	7112.0200, 9313.0301, 7112.0201, 7112.0400, 7112.0601, 7115.0201, 7114.9900, 7123.0100, 7112.0100, 7122.0100
NSQF Level	Level – 4
Duration of Craftsmen Training	One year (Two semesters each of six months duration)
Entry Qualification	Passed 8 th Class Examination under 10+2 system of Education
Unit Strength (No. Of Student)	20 (Max. supernumeraries seats: 6)
Space Norms	80 Sq. m
Power Norms	4 KW
Instructors Qualification for:	
1. Mason (Building Constructor) Trade	Degree in civil engineering from recognized university/ college with 1 year post qualification experience in relevant field. OR Diploma in civil engineering from recognized board of technical education with 2 years post qualification experience in the relevant field. OR NTC/ NAC passed in the trade of Mason (Building Constructor) with 3 years post qualification experience in relevant field. Desirable Qualification: Passed National Craft Instructor Training course in Mason (Building Constructor) trade.
2. Workshop Calculation & Science	Degree in Engineering with one year experience. OR Diploma in Engineering with two years experience. Desirable: Craft Instructor Certificate in RoD& A course under NCVT.
3. Engineering Drawing	Degree in Engineering with one year experience. OR Diploma in Engineering with two years experience. OR NTC/ NAC in the Draughtsman (Civil) with three years experience. Desirable: Craft Instructor Certificate in RoD& A course under NCVT.

4. Employability Skill	MBA OR BBA with two years experience OR Graduate in Sociology/ Social Welfare/ Economics with Two years experience OR Graduate/ Diploma with Two years experience and trained in Employability Skills from DGT institutes. AND Must have studied English/ Communication Skills and Basic Computer at 12 th / Diploma level and above. OR Existing Social Studies Instructors duly trained in Employability Skills from DGT institutes.					
List of Tools and Equipment	As per Annexure – I					
Distribution of training on Hourly basis: (Indicative only)						
Total hours /week	Trade practical	Trade theory	Work shop Cal. &Sc.	Engg. Drawing	Employability skills	Extra-curricular activity
40 Hours	25 Hours	6 Hours	2 Hours	3 Hours	2 Hours	2 Hours

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5. NSQF LEVEL COMPLIANCE

NSQF level for **Mason (Building Constructor)** trade under CTS: **Level 4**

As per notification issued by Govt. of India dated- 27.12.2013 on National Skill Qualification Framework total 10 (Ten) Levels are defined.

Each level of the NSQF is associated with a set of descriptors made up of five outcome statements, which describe in general terms, the minimum knowledge, skills and attributes that a learner needs to acquire in order to be certified for that level.

Each level of the NSQF is described by a statement of learning outcomes in five domains, known as level descriptors. These five domains are:

- Process
- professional knowledge
- professional skill
- core skill
- Responsibility

The Broad Learning outcome of **Mason (Building Constructor)** trade under CTS mostly matches with the Level descriptor at Level- 4

The NSQF level-4 descriptor is given below:

Level	Process Required	Professional Knowledge	Professional Skill	Core Skill	Responsibility
Level 4	Work in familiar, predictable, routine, situation of clear choice	Factual knowledge of field of knowledge or study	Recall and demonstrate practical skill, routine and repetitive in narrow range of application, using appropriate rule and tool, using quality concepts	Language to communicate written or oral, with required clarity, skill to basic Arithmetic and algebraic principles, basic understanding of social political and natural environment	Responsibility for own work and learning

6. LEARNING/ ASSESSABLE OUTCOME

Learning outcomes are a reflection of total competencies of a trainee and assessment will be carried out as per the assessment criteria.

6.1 GENERIC LEARNING OUTCOME

1. Recognize & comply safe working practices, environment regulation and housekeeping.
2. Understand and explain different mathematical calculation & science in the field of study including basic electrical. *[Different mathematical calculation & science -Work, Power & Energy, Algebra, Geometry & Mensuration, Trigonometry, Heat & Temperature, Levers & Simple machine, graph, Statistics, Centre of gravity, Power transmission, Pressure]*
3. Interpret specifications, different engineering drawing and apply for different application in the field of work. *[Different engineering drawing-Geometrical construction, Dimensioning, Layout, Method of representation, Symbol, scales, Different Projections, Machined components & different thread forms, Assembly drawing, Sectional views, Estimation of material, Electrical & electronic symbol]*
4. Select and ascertain measuring instrument and measure dimension of components and record data.
5. Explain the concept in productivity, quality tools, and labour welfare legislation and apply such in day to day work to improve productivity & quality.
6. Explain energy conservation, global warming and pollution and contribute in day to day work by optimally using available resources.
7. Explain personnel finance, entrepreneurship and manage/organize related task in day to day work for personal & societal growth.
8. Plan and organize the work related to the occupation.

6.2 SPECIFIC LEARNING OUTCOME

Semester – I

9. Perform wood work with carpenter's tools
10. 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.
11. Construct wall leaving space for door & window opening.

12. Perform R.C.C casting, rod cutting in different sizes, bending, binding & placing. Mixing & compaction of Concrete with different proportions.
13. Construction of cavity wall.
14. Laying out of building plan, diagonal check-up, fixing up of excavation lines
15. Wall & ceiling plastering with application of mortar, smoothening the surface by using of screeds & floats.
16. Make different types of floor with determination and formation of Slope.

Semester – II

17. Laying of drain pipe, jointing, fittings & fixing of W.C. pan, urinals, gully trap. Construction of manhole etc.
18. Construction of septic tank.
19. Fixing & fittings of wash basin, flushing cistern, sink, vent pipe, etc.
20. Construct stone wall with cutting, chamfering, beveled etc.
21. Laying of marble on floor & stair with marking, cutting & complete setting.
22. Construction of circular brick wall & hollow block walls.
23. Preparing & mixing of concrete, formwork, cutting & bending of bar, casting of roof slab, beams, lintels, stair, column etc.
24. Cutting & setting of glazed tiles to walls.
25. Laying of mosaic, terrazzo & tile flooring.
26. Construction of R.C.C. & Brick stairs.

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7. LEARNING OUTCOME WITH ASSESSMENT CRITERIA

GENERIC LEARNING/ ASSESSABLE OUTCOME	
LEARNING/ ASSESSABLE OUTCOME	ASSESSMENT CRITERIA
1. Recognize & comply safe working practices, environment regulation and housekeeping.	1.1 Follow and maintain procedures to achieve a safe working environment in line with occupational health and safety regulations and requirements.
	1.2 Recognize and report all unsafe situations according to site policy.
	1.3 Identify and take necessary precautions on fire and safety hazards and report according to site policy and procedures.
	1.4 Identify, handle and store / dispose off dangerous/unsalvageable goods and substances according to site policy and procedures following safety regulations and requirements.
	1.5 Identify and observe site policies and procedures in regard to illness or accident.
	1.6 Identify safety alarms accurately.
	1.7 Report supervisor/ Competent of authority in the event of accident or sickness of any staff and record accident details correctly according to site accident/injury procedures.
	1.8 Identify and observe site evacuation procedures according to site policy.
	1.9 Identify Personal Productive Equipment (PPE) and use the same as per related working environment.
	1.10 Identify basic first aid and use them under different circumstances.
	1.11 Identify different fire extinguisher and use the same as per requirement.
	1.12 Identify environmental pollution & contribute to avoidance of same.
	1.13 Take opportunities to use energy and materials in an environmentally friendly manner
	1.14 Avoid waste and dispose waste as per procedure
	1.15 Recognize different components of 5S and apply the same in the working environment.
2. Understand, explain different mathematical calculation & science in the field of study including basic electrical and	2.1 Explain concept of basic science related to the field such as Material science.
	2.2 Measure dimensions as per drawing
	2.3 Use scale/ tapes to measure for fitting to specification.

apply in day to day work. <i>[Different mathematical calculation & science - Geometry & Mensuration]</i>	2.4	Comply given tolerance.
	2.5	Prepare list of appropriate materials by interpreting detail drawings and determine quantities of such materials.
	2.6	Ensure dimensional accuracy of assembly by using different instruments/gauges.
3. Interpret specifications, different engineering drawing and apply for different application in the field of work. <i>[Different engineering drawing- Geometrical construction, Dimensioning, Layout, Method of representation, Symbol, scales, Different Projections, Drawing of setting out a building, Reading and Interpretation of building drawing.]</i>	3.1	Read & interpret the information on drawings and apply in executing practical work.
	3.2	Read & analyse the specification to ascertain the material requirement, tools, and construction /maintenance parameters.
	3.3	Encounter drawings with missing/unspecified key information and make own calculations to fill in missing dimension/parameters to carry out the work.
4. Select and ascertain measuring instrument and measure dimension of components and record data.	4.1	Select appropriate measuring instruments such as tape, level, etc. (as per tool list).
	4.2	Ascertain the functionality & correctness of the instrument.
	4.3	Measure dimension of the components & record data to analyse with the given drawing/measurement.
5. Explain the concept in productivity, quality tools, and labour welfare legislation and apply such in day to day work to improve productivity & quality.	5.1	Explain the concept of productivity and quality tools and apply during execution of job.
	5.2	Understand the basic concept of labour welfare legislation and adhere to responsibilities and remain sensitive towards such laws.
	5.3	Knows benefits guaranteed under various acts
6. Explain energy conservation, global warming and pollution and contribute in day to day work by optimally using available resources.	6.1	Explain the concept of energy conservation, global warming, pollution and utilize the available resources optimally & remain sensitive to avoid environment pollution.
	6.2	Dispose waste following standard procedure.
7. Explain personnel finance, entrepreneurship and manage/organize related task in day to day work for personal & societal growth.	7.1	Explain personnel finance and entrepreneurship.
	7.2	Explain role of Various Schemes and Institutes for self-employment i.e. DIC, SIDA, SISI, NSIC, SIDO, Idea for financing/ non financing support agencies to familiarizes with the Policies /Programmes & procedure & the

	available scheme.
	7.3 Prepare Project report to become an entrepreneur for submission to financial institutions.
8. Plan and organize the work related to the occupation.	8.1 Use documents, drawings and recognize hazards in the work site.
	8.2 Plan workplace/ assembly location with due consideration to operational stipulation
	8.3 Communicate effectively with others and plan project tasks
	8.4 Assign roles and responsibilities of the co-trainees for execution of the task effectively and monitor the same.



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SPECIFIC LEARNING/ ASSESSABLE OUTCOME	
LEARNING/ ASSESSABLE OUTCOME	ASSESSMENT CRITERIA
Semester-I	
9) Perform wood work with carpenter's tools	9.1 Identify the woods and character.
	9.2 Identify the Carpenter's hand Tools.
	9.3 Prepare the job as per drawing.
	9.4 Observe safety procedure during wood cutting, sawing, chiselling, planning as per standard norms and procedures.
	9.5 Check and verify the job as per drawing
10) 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.	10.1 Identify mason's tools, instruments and equipments and Plan for marking and make this available for use in a timely manner.
	10.2 Select raw material and visual inspect for defects.
	10.3 Mark as per specification applying desired mathematical calculation and observing standard procedure.
	10.4 Perform basic handling of brick, rotating of bricks in one hand and as per specification to make the job.
	10.5 Make a simple construction of different type of Brick joints with mortar.
	10.6 Observe safety procedure during above operation as per standard norms and procedures.
	10.7 Check for dimensional accuracy as per standard procedure.
	10.8 Avoid waste, ascertain unused materials and components for disposal, store these in an environmentally appropriate manner and prepare for disposal.
11) Construct wall leaving space for door & window opening.	11.1 Study drawing, Identify the door and window opening.
	11.2 Mark space for door & window.
	11.3 Make desired space for door & window during masonry work.
	11.4 Check the opening space as per Drawing.
12) Perform R.C.C casting, rod cutting in different sizes, bending, binding & placing. Mixing & compaction of	12.1 Read and interpret the drawing
	12.2 Identify required Mason's hand tools.
	12.3 Cut rods as per size with cutting tools.
	12.4 Bend bar (rod) as per drawing with bar bending die.
	12.5 Check the measurement of bar as per drawing.

Concrete with different proportions.	12.6	Bind rods with [proper hand tools as per drawing.
	12.7	Identify the equipment's for mixing concrete.
	12.8	Mix up simple concrete as per specified ratio.
	12.9	Laying of concrete and compact as per procedure.
	12.10	Observe safety procedure during concreting.
	12.11	Check and verify the job as per drawing.
13. Construction of cavity wall.	13.1	Identify different types of Mason's hand tools.
	13.2	Identify the Construction materials.
	13.3	Plan for cavity wall construction.
	13.4	Make a cavity wall in brick Masonry work.
	13.5	Check & verify the job as per drawing.
14. Laying out of building plan, diagonal check-up, fixing up of excavation lines	14.1	Identify different types of Mason's hand tools & equipment's for laying out.
	14.2	Set right angle on the ground following proper method.
	14.3	Laying out the building plan .
	14.4	Check the diagonal.
	14.5	Mark excavation lines as per Drawing.
	14.6	Check & verify the work as per drawing.
15 Wall & ceiling plastering with application of mortar, smoothening the surface by using of screeds & floats.	15.1	Identify different types of plastering tools
	15.2	Make scaffolding as per requirement
	15.3	Prepare mortar in specified proportions.
	15.4	Apply mortar on wall surface & ceiling.
	15.5	Make plaster work.
	15.6	Observe safety procedure during plaster.
16 Make different types of floor with determination and formation of Slope.	16.1	Identify different types floors
	16.2	Identify different types of tools required for flooring.
	16.3	Determine slope and make floor accordingly.
	16.4	Check and verify the job as per requirements.
<u>Semester- II</u>		
17 Laying of drain pipe, jointing, and fittings & fixing of W.C. pan, urinals, gully trap. Construction of manhole etc.	17.1	Plan for the desired work and identify tools, instrument and equipments for marking and make this available for use on a timely manner.
	17.2	Select and Prepare raw materials, fittings, etc. and visually inspect for defects.
	17.3	Mark the position to fix the fittings.
	17.4	Set up a W.C pan & urinals
	17.5	Construct a gully trap, manhole.
	17.6	Observe safety points on above work as per standard norms and guidelines.
18 Construction of septic tank.	18.1	Read and interpret the drawing

	18.2	Mark the position of septic tank for excavation.
	18.3	Construct Septic tank conforming PWD norms
	18.4	Check bonding & waterproofing of tank walls
	18.5	Perform lining field drains with bricks
	18.6	Check and verify the work as per standard norms and guidelines.
19. Fixing& fittings of wash basin, flushing cistern, sink, vent pipe, etc.	19.1	Plan for the work and select the tools, instrument and equipment for the Fixing& fittings of wash basin, flushing cistern, sink, vent pipe, etc.
	19.2	Mark the position and fix fittings e.g. wash basin, flushing cistern, sink, vent pipe, etc. observing standard procedure and method.
	19.3	Check and verify the work as per standard norms and guidelines.
20. Construct stone wall with cutting, chamfering, beveled etc.	20.1	Identify tools, instrument and equipment's for marking, cutting and make this available for use in a timely manner.
	20.2	Measure and cut stone & chamfer as required.
	20.3	Construct stone masonry wall.
	20.4	Check for finishing and dimensional accuracy as per standard procedure.
21. Laying of marble on floor & stair with marking, cutting & complete setting	21.1	Plan and identify tools and equipment for marking, cutting and make this available for use in a timely manner.
	21.2	Select raw materials and inspect visually for defect.
	21.3	Measure, mark and cut marble as required.
	21.4	Lay marble on floor and stair.
	21.5	Observe safety procedure during above work as per standard norms.
	21.6	Check for finishing and dimensional accuracy as per standard procedure.
22 Construction of circular brick wall & hollow block walls.	22.1	Plan for the work and arrange materials, tools and equipment for circular / hollow brick work.
	22.2	Prepare bricks as required in circular / hollow brick wall.
	22.3	Construct circular / hollow block wall.
	22.4	Check for finishing and dimensional accuracy as per standard procedure.
23 Preparing & mixing of concrete, formwork, cutting	23.1	Read and interpret the drawing
	23.2	Make shuttering and formwork with proper support.

& bending of bar, casting of roof slab, beams, lintels, stair, column etc.	23.3	Perform cutting & bending of bar & bind them as per measurement and drawing.
	23.4	Perform levelling and check measurement criteria.
	23.5	Mix concrete and cast roof slab, beams, lintels, stair, column etc. as per measurement and drawing.
	23.6	Observe safety procedure during above work as per standard norms.
24 Cutting & setting of glazed tiles to walls	24.1	Plan for the work and arrange for raw material and different types of plastering, pointing & tile setting tools.
	24.2	Prepare wall surface and mortar in specified proportions.
	24.3	Perform pointing to wall and apply mortar on wall surface.
	24.4	Marking & Cutting of glazed tiles as per requirement
	24.5	Set glazed tiles to wall and fill joints.
	24.6	Check for finishing and dimensional accuracy
25) Laying of mosaic, terrazzo & tile flooring.	25.1	Plan for the work and arrange for raw material and different types of tile setting tools.
	25.2	Prepare floor surface and mortar in specified proportions.
	25.3	Perform levelling to floor applying mortar on floor surface.
	25.4	Marking & Cutting of floor tiles
	25.5	Setting of tiles on floor.
	25.6	Check for finishing and dimensional accuracy
26 Construction of R.C.C. & Brick stairs	26.1	Read and interpret the drawing
	26.2	Make shuttering and formwork with proper support.
	26.3	Perform cutting & bending of bar & bind them as per measurement and drawing.
	26.4	Perform levelling and check measurement criteria.
	26.5	Mix concrete and cast R.C.C stair or perform construction of brick stair as per measurement and drawing.
	26.6	Observe safety procedure during above work as per standard norms.

SYLLABUS – MASON (BUILDING CONSTRUCTOR)

FIRST SEMESTER – 06 Months

Week No.	Ref. Learning Outcome	Professional Skills (Trade Practical) With Indicative Hours	Professional Knowledge (Trade Theory)
1-2	Recognize & comply safe working practices, environment regulation and housekeeping.	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 Danger, Warning, caution & personal safety message. (3 hrs) 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)	• 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

3-4	Perform wood work with carpenter's tools	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 & formwork (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.
5-10	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 of ingredients.(6 hrs) 23. Building $4\frac{1}{2}$" straight wall about 6 courses high with one end stepped and the other racked back. (24 hrs) 24. Building $4\frac{1}{2}$" quoin wall with one end stepped and the other racked back. Use of plumb rule. (26 hrs) 25. Construct of 1 & 1 ½ brick wall junctions in English & Flemish bonds. Racking out the joints & finishing it flush. (24 hrs) 26. Construction of 1 brick thick walls in English & Flemish garden bonds. (24 hrs) 27. Construct of detached brick pillars with footings-square & rectangular types. (24 hrs)	- 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 & 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.
11	Construct wall leaving space for door & window opening.	28. Form a door opening in a wall of English bond. Bonding of jambs & reveals. (10 hrs) 29. Form a window opening in a wall in English bond. (7 hrs) 30. Construction of sill with over Sailing courses. Use of gauge rod fixing door & window frames. (8 hrs)	- Purpose of arch centering& form work. Different types of bricks & their sizes.Characteristics of good bricks Sizes of mortar joints for different works. Stretcher & header - Construction of sill with over sailing courses-gauge rod-its purpose. Method of fixing door & window frames. Hold fasts & dowels-purpose and method of fixing. PWD specification on the above.
12-13	Perform R.C.C casting, rod cutting in different sizes, bending, binding & placing. Mixing & compaction of Concrete with different proportions.	31. Demonstrate R.C.C, re-inforcement 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 position. Check for equal bearing. (8 hrs) 33. Spanning of opening by casting a lintel in site. (10 hrs) 34. Making of shuttering & supports with uprights and wedges. (7 hrs) 35. Cutting, bending & placing of reinforcement. (4 hrs) 36. Mixing, placing & compacting concrete.(2 hrs) 37. Spanning of opening with a semi-circular arch, making	- RCC lintels: Materials required, - method of construction, precast lintels, - method of construction of formwork, - details of reinforcement. - Arches: Purpose, technical terms & types. Setting out an arch. - Tummel & template for preparing voussoirs & keybricks. - Method of constructing centering for an arch.

		centering, cutting of templates for voussoirs & preparing voussoirs, setting uprights of arch. Construction of arch & removing centering. (15 hrs)	
14	Construction of cavity wall.	38. Construct cavity walls, Setting out both leaves, provision of wall ties, 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.
15-16	Laying out of building plan, diagonal check-up, fixing up of excavation lines	39. Setting out a building: Obtaining first, second, third & fourth lines, marking diagonals, setting out cross walls & offsets. (30 hrs) 40. Marking excavation lines & fixing of plinth & floor levels. (20 hrs)	• Steps in setting out & marking centre line, excavation line & other lines-use of dead man-checking accuracy & precautions. Windows & ventilators: Including steel windows & ventilators, fixtures & fastenings used.
17-19	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 or concrete slab for the purpose of demonstration). (25 hrs)	• Plastering: Tools used, necessity of screeds & their fixing, • Steps in plastering. • Concrete: Ingredients, selection of materials, 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.
20-21	Make different types of floor with determination and	44. Flooring practice: Determination and Formation of slope, application of slurry for finishing, setting out of	• Floors: Types, constructional details such as consolidation of

	formation of Slope.	skirting, formation of spots for skirting. (30 hrs) 45. Use of screeds, formation of curve at the junction of skirting & floor. (20 hrs)	bed, sand filling, concrete base & finishing. Granolithic flooring. Local Municipal byelaws. • Tiles for roofing & flooring. Purpose of wetting bricks & tiles before use.
22-23	In-plant training/ Project work Broad Areas: - Make a wooden stool. - Construct one brick thick circular tank. - Construct a R.C.C. lintel. - Plastering 10ft.x4ft. on brick surface.		
24	Revision		
25-26	Examination		

Note: -

- Some of the sample project works (indicative only) are given against each semester.
- Instructor may design their own project and also inputs from local industry may be taken for designing such new project.
- The project should broadly cover maximum skills in the particular trade and must involve some problem solving skill. Emphasis should be on Teamwork: Knowing the power of synergy/ collaboration, work to be assigned in a group (Group of at least 4 trainees). The group should demonstrate Planning, Execution, Contribution and Application of Learning. They need to submit Project report.
- If the instructor feels that for execution of specific project more time is required than he may plan accordingly to produce components/ sub-assemblies in appropriate time i.e., may be in the previous semester or during execution of normal trade practical.

SYLLABUS – MASON (BUILDING CONSTRUCTOR)

SECOND SEMESTER – 06 Months

Week No.	Ref. Learning Outcome	Professional Skills (Trade Practical) With Indicative Hours	Professional Knowledge (Trade Theory)
27-30	Laying of drain pipe, jointing, fittings & fixing of W.C. pan, urinals, gully trap. Construction of manhole etc.	46. Drainage: Set out a drainage line including position of manhole & gully trap. (22 hrs) 45. Practice in setting up and reading of dumpy level. (16 hrs) 46. Lay out drainage to required gradients with the help of dumpy level and/or boning rod and laying its surface with bricks. (26 hrs) 47. Laying of concrete foundation for drainage pipes and jointing. Checking of alignment. Cutting the pipe to the required length. (10 hrs) 48. Covering of drain pipe with concrete as per PWD specification. (4 hrs) 49. Laying out foundation concrete and construction of manhole. (12 hrs) 50. Method of providing footrests, forming of drain 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.
31-32	Construction of septic tank. Fixing & fittings of wash basin, flushing cistern, sink, vent pipe, etc.	51. Construct Septic tank conforming PWD norms, Bonding & waterproofing of tank walls, lining field drains with bricks. Shoring for deep trenches following proper Safety precautions. (30 hrs) 52. Fix brackets for washbasin	- Septic tank: Purpose, parts and method of construction. - Bonding & waterproofing of tank walls. - Method of lining field drains with bricks. Shoring for deep trenches. Safety precautions.

		and flushing cistern. (06 hrs) 53. Fix WC pan, kitchen & bathroom traps , sinks, etc. fixing of vent pipe to walls. (14 hrs)	
33-34	Construct stone wall with cutting, chamfering, beveled etc.	54. Stonework - method of cutting stone in required size from a block. (8 hrs) 55. Selection of face & bed. (1 hr) 56. Construct stone wall: Ashlar masonry. Types of joint used in ashlar such as chamfered, beveled, etc. through stones & bond stones. (16 hrs) 57. Construct a rubble masonry wall. (15 hrs) 58. Construct compound wall with attached piers and coping. (10 hrs)	- 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.
35-36	Laying of marble on floor & stair with marking, cutting & complete setting.	59. Marble work: Method of cutting and setting on stair, floor, wall & pillar. (50 hrs)	Marble floor: types, constructional details. Construction of attached piers & buttresses.
37-38	Construction of circular brick wall & hollow block walls.	60. Construct a $4\frac{1}{2}$ " dia. X 9" thick circular brick wall 4 layers. (20 hrs) 61. Construct circular gate pillars with brick/stone/tile/concrete. (16 hrs) 62. Construct hollow block walls. (14 hrs)	- Circular walls: Details of construction. Purpose-made bricks. - Setting out and construction of circular gate pillars with 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.
39-43	Preparing & mixing of concrete, formwork, cutting & bending of bar, casting of roof slab,	63. Construct roof with prefabricated hollow blocks of beams and slabs. (125 hrs)	- Introduction to RCC: Uses, materials, properties and formwork, bending of bars & construction. - Reference to ISI code.

	beams, lintels, stair, column etc.		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.
44-45	Cutting & setting of glazed tiles to walls.	Finishing works : 64. External / internal wall finishing practice by plastering or Pointing. (20 hrs) 65. Fixing cement concrete jelly. (3 hrs) 66. Laying of glazed tiles. (18 hrs) 67. Fixing the thread, filling between ends, plumbing, setting out a jamb, bonding. (6 hrs) 68. Marking & cutting tiles. (3 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 wall facing, steps in fixing, precautions. • Construction & expansion joints-method of filling-repair of cracks.
46-47	Laying of mosaic, terrazzo & tile flooring. Construction of R.C.C. & Brick stairs	69. Flooring: Mosaic, terrazzo, and tile flooring. (30 hrs) 70. 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.
48-49	<u>In plant training/ Project work</u> Broad areas: - Install a W.C. pan. - Construct of a circular brick wall - Construct a manhole. - Set glazed tiles on wall.		
50	Revision		
51-52	Examination		

Note: -

5. *Some of the sample project works (indicative only) are given against each semester.*
6. *Instructor may design their own project and also inputs from local industry may be taken for designing such new project.*
7. *The project should broadly cover maximum skills in the particular trade and must involve some problem solving skill. Emphasis should be on Teamwork: Knowing the power of synergy/ collaboration, work to be assigned in a group (Group of at least 4 trainees). The group should demonstrate Planning, Execution, Contribution and Application of Learning. They need to submit Project report.*
8. *If the instructor feels that for execution of specific project more time is required than he may plan accordingly to produce components/ sub-assemblies in appropriate time i.e., may be in the previous semester or during execution of normal trade practical.*



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9. SYLLABUS - CORE SKILLS

8.1 Workshop Calculation Science & Engineering Drawing

S No.	Workshop Calculation and Science	Engineering Drawing
First Semester		
Duration: Six Month		
1.	Site problems involving multiplication & division of whole numbers.	Sketching of tools.
2.	Addition, subtraction multiplication & division of fractions.	Sketching of various carpentry joints.
3.	Application of fractions to site problems	Sketching of jointing devices and the joints made with them. Sketching of arch centering, door frames with joints, etc.
4.	Decimals: Addition, subtraction, multiplication & division. Conversion of decimal to fraction and vice-versa. Site problems.	Drawing: a language of communication. Properties of lines, angles, triangles & circles. Drawing practice of these geometrical figures including pictorial views.
5.	Square root of perfect squares-whole numbers & decimals.	Freehand sketching of simple solids such as cubes, cuboids, cylinders and views of these objects when viewed perpendicular to their surfaces or axes.
6.	Metric System: Measurement of length, breadth & height in metric units.	Freehand sketching of bricks, queen closers, king closers and bats.
7.	Measurement of weight in metric system. Unit conversion. Problems.	Preparation of freehand sketches in plan & elevation of 4 $\frac{1}{2}$ " wall-Quoins & Junctions.
8.	Ratio and proportion: Problems to find out quantities of materials for various mortar & concrete mixes.	Preparation of freehand sketches of rat trap bond and other ornamental panels.
9.	Mensuration: Areas & perimeters of rectangles, squares and triangles.	Use of drawing instruments-'T' square, drawing board, etc. Printing of letters & numbers.
10.	Areas & perimeters of circles, sectors, segments, quadrilaterals, trapezium, parallelogram & rhombus.	Drawing of simple geometrical problems involving lines, squares & polygons.
11.	Problems on areas & perimeters of polygons such as pentagons, hexagons & octagons.	Construction & reading of plain scales. Reading of tapes & foot rules.
12.	Volume & surface area of simple geometrical solids such as cubes & prisms.	Drawing architectural drawings such as ovolo, cavetto, bolten, scotia, cyma recta, cyma reversa, astragal, etc.
13.	Mensuration applied to area & volume of brickwork. Calculation of cement & sand required.	Different types of lines & symbols used in building drawings.

14.		Simple isometric scaled drawings, isometric views of simple objects such as cubes, cuboids, square & rectangular prisms and pyramids.
Second Semester Duration: Six Month		
1	Simple cost comparison between facing bricks & common bricks. Cost comparison between walls built in English/Flemish/garden wall bonds/cavity walls.	Isometric views of simple objects such as cubes, cuboids, square & rectangular prisms and pyramids.
2	Problems on areas. Allowances for simple rectangular window & other openings.	Projections of solids.
3	Weight of walling supported by lintels and arches-simple problems.	Code of practice for general engineering drawing as per ISI.
4	Calculation of rise & span for arches.	Drawing to scale: a) $4\frac{1}{2}$ " stepped wall, b) $4\frac{1}{2}$ " wall racked back, c) 9" walls in English & Flemish bonds showing stepped end, racking back & toothing.
5	Volume of brickwork in mass retaining walls.	Drawing to scale: a) $4\frac{1}{2}$ " quoin wall with stepped end & racking back, b) $4\frac{1}{2}$ " junction wall, c) 9" quoin wall in English & Flemish bonds, d) 9" Flemish bonded wall junction, e) 9" wall in garden wall bond, f) $13\frac{1}{2}$ " main wall in garden wall bond & 9" cross wall in English / Flemish bond.
6	Volume of stonework or concrete work required for a given piece of work.	Drawing to scale: 18" wall in English garden wall bond.
7	Mensuration applied to area of marble works.	Hexagonal & octagonal pillars showing bonds and cavities.
8	Calculation of length & weight of steel reinforcement from detailed RCC drawings.	Preparation of drawing showing timbering in trenches.
9	Calculation of quantities of cement, sand, aggregate & reinforcement for a given RCC work.	Preparation of drawings showing methods of setting out simple segmental, circular & elliptical arches.
10	Calculation of quantities of various materials for brick/tile/cement concrete/terrazzo flooring. Quantities of materials required for skirting.	Drawing of setting out a building showing the centre line, width of excavation, foundation concrete, footings & superstructure. Checking of accuracy.
11	Calculation of length of drainage pipe & materials for foundation & covering concrete.	Interpretation of building drawing. Preparation of plan, elevation & section of a simple building.
12	Calculation of materials required for a manhole from given drawing.	Reading of a building plan showing drainage line, position of manhole, etc.
13		Constructional details of hollow block roof with precast RCC joints.

14		Drawing of manhole and inspection chamber with details.
15		Stonework: Drawing of random rubble, coursed rubble & ashlar masonry. Layout of stairs.
16		Drawing of stone pillar showing architectural moulding.



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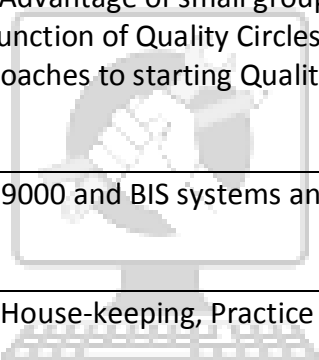
9.3 CORE SKILL – EMPLOYABILITY SKILL

1 st Semester		
1. English Literacy		Duration : 20 Hrs. Marks : 09
Pronunciation	Accentuation (mode of pronunciation) on simple words, Diction (use of word and speech)	
Functional Grammar	Transformation of sentences, Voice change, Change of tense, Spellings.	
Reading	Reading and understanding simple sentences about self, work and environment	
Writing	Construction of simple sentences Writing simple English	
Speaking / Spoken English	Speaking with preparation on self, on family, on friends/ classmates, on know, picture reading gain confidence through role-playing and discussions on current happening job description, asking about someone's job habitual actions. Cardinal (fundamental) numbers ordinal numbers. Taking messages, passing messages on and filling in message forms Greeting and introductions office hospitality, Resumes or curriculum vita essential parts, letters of application reference to previous communication.	
2. I.T. Literacy		Duration : 20 Hrs. Marks : 09
Basics of Computer	Introduction, Computer and its applications, Hardware and peripherals, Switching on-Starting and shutting down of computer.	
Computer Operating System	Basics of Operating System, WINDOWS, The user interface of Windows OS, Create, Copy, Move and delete Files and Folders, Use of External memory like pen drive, CD, DVD etc, Use of Common applications.	
Word processing and Worksheet	Basic operating of Word Processing, Creating, opening and closing Documents, use of shortcuts, Creating and Editing of Text, Formatting the Text, Insertion & creation of Tables. Printing document. Basics of Excel worksheet, understanding basic commands, creating simple worksheets, understanding sample worksheets, use of simple formulas and functions, Printing of simple excel sheets.	
Computer Networking and Internet	Basic of computer Networks (using real life examples), Definitions of Local Area Network (LAN), Wide Area Network (WAN), Internet, Concept of Internet (Network of Networks), Meaning of World Wide Web (WWW), Web Browser, Web Site, Web page and Search Engines. Accessing the Internet using Web Browser, Downloading and Printing Web Pages, Opening an email account and use of email. Social media sites and its implication. Information Security and antivirus tools, Do's and Don'ts in Information Security, Awareness of IT - ACT, types of cyber crimes.	

3. Communication Skills		Duration : 15 Hrs. Marks : 07
Introduction to Communication Skills	Communication and its importance Principles of Effective communication Types of communication - verbal, non verbal, written, email, talking on phone. Non verbal communication -characteristics, components-Para-language Body language Barriers to communication and dealing with barriers. Handling nervousness/ discomfort.	
Listening Skills	Listening-hearing and listening, effective listening, barriers to effective listening guidelines for effective listening. Triple- A Listening - Attitude, Attention & Adjustment. Active Listening Skills.	
Motivational Training	Characteristics Essential to Achieving Success. The Power of Positive Attitude. Self awareness Importance of Commitment Ethics and Values Ways to Motivate Oneself Personal Goal setting and Employability Planning.	
Facing Interviews	Manners, Etiquettes, Dress code for an interview Do's & Don'ts for an interview.	
Behavioral Skills	Problem Solving Confidence Building Attitude	
2nd Semester		
4. Entrepreneurship Skills		Duration : 15 Hrs. Marks : 06
Concept of Entrepreneurship	Entrepreneur - Entrepreneurship - Enterprises:-Conceptual issue Entrepreneurship vs. management, Entrepreneurial motivation. Performance & Record, Role & Function of entrepreneurs in relation to the enterprise & relation to the economy, Source of business ideas, Entrepreneurial opportunities, The process of setting up a business.	
Project Preparation & Marketing analysis	Qualities of a good Entrepreneur, SWOT and Risk Analysis. Concept & application of PLC, Sales & distribution Management. Different Between Small Scale & Large Scale Business, Market Survey, Method of marketing, Publicity and advertisement, Marketing Mix.	
Institutions Support	Preparation of Project. Role of Various Schemes and Institutes for self-employment i.e. DIC, SIDA, SISI, NSIC, SIDO, Idea for financing/ non financing support agencies to familiarizes with the Policies /Programmes &	

	procedure & the available scheme.
Investment Procurement	Project formation, Feasibility, Legal formalities i.e., Shop Act, Estimation & Costing, Investment procedure - Loan procurement - Banking Processes.
5. Productivity	
Duration : 10 Hrs. Marks : 05	
Benefits	Personal / Workman - Incentive, Production linked Bonus, Improvement in living standard.
Affecting Factors	Skills, Working Aids, Automation, Environment, Motivation - How improves or slows down.
Comparison with developed countries	Comparative productivity in developed countries (viz. Germany, Japan and Australia) in selected industries e.g. Manufacturing, Steel, Mining, Construction etc. Living standards of those countries, wages.
Personal Finance Management	Banking processes, Handling ATM, KYC registration, safe cash handling, Personal risk and Insurance.
6. Occupational Safety, Health and Environment Education	
Duration : 15 Hrs. Marks : 06	
Safety & Health	Introduction to Occupational Safety and Health importance of safety and health at workplace.
Occupational Hazards	Basic Hazards, Chemical Hazards, Vibroacoustic Hazards, Mechanical Hazards, Electrical Hazards, Thermal Hazards. Occupational health, Occupational hygienic, Occupational Diseases/ Disorders & its prevention.
Accident & safety	Basic principles for protective equipment. Accident Prevention techniques - control of accidents and safety measures.
First Aid	Care of injured & Sick at the workplaces, First-Aid & Transportation of sick person.
Basic Provisions	Idea of basic provision legislation of India. safety, health, welfare under legislative of India.
Ecosystem	Introduction to Environment. Relationship between Society and Environment, Ecosystem and Factors causing imbalance.
Pollution	Pollution and pollutants including liquid, gaseous, solid and hazardous waste.
Energy Conservation	Conservation of Energy, re-use and recycle.
Global warming	Global warming, climate change and Ozone layer depletion.
Ground Water	Hydrological cycle, ground and surface water, Conservation and Harvesting of water.

Environment	Right attitude towards environment, Maintenance of in-house environment.
7. Labour Welfare Legislation	
	Duration : 05 Hrs. Marks : 03
Welfare Acts	Benefits guaranteed under various acts- Factories Act, Apprenticeship Act, Employees State Insurance Act (ESI), Payment Wages Act, Employees Provident Fund Act, The Workmen's compensation Act.
8. Quality Tools	
	Duration : 10 Hrs. Marks : 05
Quality Consciousness	Meaning of quality, Quality characteristic.
Quality Circles	Definition, Advantage of small group activity, objectives of quality Circle, Roles and function of Quality Circles in Organization, Operation of Quality circle. Approaches to starting Quality Circles, Steps for continuation Quality Circles.
Quality Management System	Idea of ISO 9000 and BIS systems and its importance in maintaining qualities.
House Keeping	Purpose of House-keeping, Practice of good Housekeeping.
Quality Tools	Basic quality tools with a few examples.


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LIST OF TOOLS AND EQUIPMENT			
MASON (Building Constructor) (For batch of 20 trainees)			
S No.	Name of the Tools & Equipment	Specification	Quantity
A. TRAINEES TOOL KIT (for 20 Trainees and One Instructor)			
1	Bolster	4" (100mm)	21 nos.
2	Pitching tool (mason)		21 nos.
3	Chisel (mason) Hammer headed punch		21 nos.
4	-do-	1/2" (12mm)	21 nos.
5	-do-	1" (25mm)	21 nos.
6	-do-	Cross cut type	21 nos.
7	-do-	3/4" (18mm)	21 nos.
8	-do-	1 1/2" (35mm)	21 nos.
9	Club hammer	1 1/2" / 1pbs.	21 nos.
10	Hammer (mason) brick	(600-800gm)	21 nos.
11	Helmet		21 nos.
12	Leather gloves		21 nos.
13	Goggles		21 nos.
14	Plumb level	36" (1m)	21 nos.
15	Pins (Line)		21 nos.
16	Plumb bob		21 nos.
17	Steel square		21 nos.
18	Plastering trowel-double		21 nos.
19	Wooden float		21 nos.
20	Trowel-brick	10" (25cm) long	21 nos.
21	Trowel-pointing	6" (15cm)	21 nos.
22	Tasla (tin) pan		21 nos.
23	Wooden straight edge	4'	21 nos.
24	Bucket		21 nos.
B. TOOLS, MEASURING INSTRUMENTS AND GENERAL SHOP OUTFIT - For 2 (1+1) units no additional items are required			
25.	Spade		12 nos.
26.	Shovel		12 nos.
27.	Measuring steel tape	15m	3 nos.
28.	Measuring tape	30m	2 nos.

29.	Ladder	2-4m	3 nos.
30.	Sledge hammer	4kg	3 nos.
31.	Drum	45gallons	3 nos.
32.	G.I. pipe	1" (25mm) dia.	200 nos.
33.	Hose pipe		60 m
34.	G.I. pipe	1 1/2" (12mm) dia.	200 nos.
35.	Cellotax board		3 nos.
36.	Spirit level	6" (15cm)	20 nos.
37.	chop saw machine	200 watt	2 sets
38.	Spirit level	12" (30cm)	5 nos.
39.	Screw driver		5 nos.
40.	Pocket steel tape	6' long	20 nos.
41.	Pickaxe		5 nos.
42.	Crowbar	1.5m long	3 nos.
43.	Scraper		20 nos.
44.	Snip straight	10" (25cm)	5 nos.
45.	Carpenter tool kit of 20 sets		
	(a) Handsaw		1 no.
	(b) Mortise chisel		1 no.
	(c) Tenion saw		1 no.
	(d) Firmer chisel		1 no.
	(e) Mallet		1 no.
	(f) Carpenter claw hammer		1 no.
	(g) Hand brace with bits		1 no.
	(h) Plane		1 no.
46.	Wheel barrow		5 nos.
47.	Tubular scaffolding		As required
48.	Steel measuring boxes	(0.6 cft & 1.2 cft)	4 each
49.	Adjustable steel props		30 nos.
50.	Bending rods		3 nos.
51.	Bar bending die	one end 6mm and other 8mm	6 nos.
52.	- Do -	one end 10mm and other 12mm	6 nos.
53.	Dumpy level with stand & staff		3 nos.
54.	Spanner set		1 no.
55.	Rammer		6 nos.
56.	Steel shuttering	400 sqm	2 sets
57.	Bench grinder		2 nos.
58.	Drilling machine		2 nos.
59.	Steel lockers	with 8 drawers Metal rack (1800x1500x450mm)	3 nos.

60.	Metal rack	1800X1500X450mm	1 no.
61.	Desk		1 no.
62.	Stool		1 no.
63.	Black Board with glass		1 no.
64.	Fire Extinguisher		1 no.
65.	Fire Buckets with stand		1 nos.
66.	Steel Almirah (large)		1no
67.	Instructor table and chair		1 No.
C. TOOLS & EQUIPMENT FOR DRAWING HALL			
68.	Engineering Instrument Box		21 nos.
69.	Protractor	15 cm full circular	21 nos.
70.	Card board/ plastic metric scale set	A to H	21 nos.
71.	Celluloid set square	45° & 60°	21 nos.
72.	Drawing board	1250 x 900 mm	21 nos.
73.	T square 1250 mm/ Mini drafter		21 nos.
74.	Erasing shield small size		21 nos.
75.	Architect's & builder's template		21 nos.
76.	Drawing machine	(Horizontal type)	21 nos.
77.	French curve- set of 12		21 nos.

Note:

- Dumpy level need not be provided, if the institute has Surveyor/ Draughtsman Civil trade.*
- Sl. Nos. 25 to 34 need not be provided, if the institute has Surveyor/ Architecture/ Draughtsman Civil/ Draughtsman Mechanical/ other similar trades.*

TOOLS & EQUIPMENT FOR EMPLOYABILITY SKILLS		
S No.	Name of the Equipment	Quantity
1.	Computer (PC) with latest configurations and Internet connection with standard operating system and standard word processor and worksheet software	10 Nos.
2.	UPS - 500VA	10 Nos.
3.	Scanner cum Printer	1 No.
4.	Computer Tables	10 Nos.
5.	Computer Chairs	20 Nos.
6.	LCD Projector	1 No.
7.	White Board 1200mm x 900mm	1 No.
Note: - Above Tools & Equipments not required, if Computer LAB is available in the institute.		



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FORMAT FOR INTERNAL ASSESSMENT

Name & Address of the Assessor:						Year of Enrollment:								
Name & Address of ITI (Govt./Pvt.):						Date of Assessment:								
Name & Address of the Industry:						Assessment location: Industry/ ITI								
Trade Name:			Semester:			Duration of the Trade/course:								
Learning Outcome:														
S No.	Maximum Marks (Total 100 Marks)		15	5	10	5	10	10	5	10	15	15	Total Internal Assessment Marks	Result (Y/N)
	Candidate Name	Father's/Mother's Name	Safety Consciousness	Workplace Hygiene	Attendance/ Punctuality	Ability to Follow Manuals/ Written Instructions	Application of Knowledge	Skills to Handle Tools & Equipment	Economical Use of Materials	Speed in Doing Work	Quality in Workmanship	VIVA		
1														
2														