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

COMPETENCY BASED CURRICULUM

STONE PROCESSING MACHINE OPERATOR

(Duration: One Year)

CRAFTSMEN TRAINING SCHEME (CTS)

NSQF LEVEL- 4

SECTOR – MINING & MINERAL PROCESSING

STONE PROCESSING MACHINE OPERATOR

(Engineering Trade)

(Revised in 2018)
Version: 1.0

CRAFTSMEN TRAINING SCHEME (CTS)

NSQF LEVEL - 4

Developed By

Ministry of Skill Development and Entrepreneurship

Directorate General of Training
CENTRAL STAFF TRAINING AND RESEARCH INSTITUTE
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List of Expert members participated for finalizing the course curriculum of Stone Processing Machine Operator Trade.

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CONTENTS

1. COURSE INFORMATION

During the one-year duration of "Stone Processing Machine Operator" trade, a candidate is trained on Professional Skill, Professional Knowledge and Employability Skill. In addition to this, a candidate is entrusted to undertake project work, extracurricular activities and on-the-job training to build up confidence. The broad components covered related to the trade are categorized in two semester, each of six months duration. The semester wise course coverage is categorized as below: -

1st Semester - In this semester the trainee will learn Industrial discipline and working environment, safety -including fire equipments and their uses. The trainees will identify different types of stones, their dimension & decoration, Commercial varieties and different types of textures in stones. They will also apply the Methods of finding stone strength, chemical composition and physical characteristics. They will be familiar with simple fitting operations, hacks awing, punching and filing. Marking instruments and their uses. Use of vernier caliper, micrometer, Method of using drills taps and dies. The trainees will be also able to identify Types of hack saw frames and blades, Vernier calliper and Micrometer and their use. The trainees will gain knowledge of Fundamental of electricity. Explanation of electrical measuring instruments Ammeters, Voltmeter, Energy meter. They will also acquire knowledge of characterization of dimensional stone i.e. marble, granite, sand stone, kota stone (flaggy limestone), slate etc. Identifying of the mineral by petrographic examination. They will be able to Demonstrate and Practice on lifting/moving block, Dressing, Cutting/sawing, Calibrating, Polishing, Edge cutting, Chamfering, Grooving. They will also Practice on Block handling, Uses of unloading & loading the block, Uses of AT drive/CT drive. They will know Construction and Working principle of Gantry crane, explanation of major parts and their working procedure. They will acquire knowledge of maintenance procedure of Gantry crane.

2nd Semester - In the second semester the trainee will know Construction and working principle of diamond gang saw/steel gang saw, Mono blade dresser, Circular saws, Polishing machine, Calibrating machine, Edge cutting/cross cutting machine, Slicing machine- their types as per capacity, their working and maintenance procedure. They will be able to demonstrate and practice operations of various machines used viz. diamond gang saw/steel gang saw, Mono blade dresser, Circular saws, Polishing machine, Calibrating machine, Edge cutting/cross cutting machine, Slicing machine, Abrasive. The trainees will be able to maintain safety measures during performing various jobs.

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 economy/ Labour market. The vocational training programmes are delivered under the aegis of National Council of Vocational Training (NCVT). Craftsman Training Scheme (CTS) and Apprenticeship Training Scheme (ATS) are two pioneer programmes of NCVT for propagating vocational training.

Stone Processing Machine Operator trade under CTS is delivered nationwide through a 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) imparts professional skills and knowledge, while Core area (Workshop Calculation & science, Engineering Drawing and Employability Skills) impart requisite core skill, knowledge and life skills. After passing out the training program, the trainee is awarded National Trade Certificate (NTC) by NCVT which is recognized worldwide.

Trainee broadly needs to demonstrate that they are able to:

- Read and interpret technical parameters/ documentation, plan and organize work processes, identify necessary materials and tools.
- Perform tasks with due consideration to safety rules, accident prevention regulations and environmental protection stipulations.
- Apply professional knowledge & employability skills while performing the job and modification & maintenance work.
- Check the task/job for functioning, identify and rectify errors in task/job.
- Document the technical parameter related to the task undertaken.

2.2 CAREER PROGRESSION PATHWAYS

- Can join the apprenticeship program in different types of industries leading to a National Apprenticeship Certificate (NAC).
- Can join stone processing industries as Stone Processing Machine Operator.

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)	1100
2	Professional Knowledge (Trade Theory)	264
3	Workshop Calculation & Science	88
4	Engineering Drawing	132
5	Employability Skills	110
6	Library & Extracurricular activities	66
7	Project Work	160
8	Revision & Examination	160
	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	• Good skill levels in the use of hand tools, machine tools and workshop equipment.

reasonable standard of craftsmanship, with little guidance, and regard for safety procedures and practices	• 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.

3. JOB ROLE

Brief description of job roles:

Crusher Attendant, Stone: operates machine in which lumps of stone are crushed to reduce them to desired size. Starts machine and regulates flow of stones from conveyor chutes or bins, shovels or throws stones into hopper of machine; prods large sized stone pieces to force them between crusher jaws with bar; breaks oversize stones with hand hammer; loosens clogged material in machine with bar; places empty containers at delivery-end to receive crushed materials; cleans, lubricates and makes minor repairs to machine. May operate machine fitted with conveyor system and may sieve powder into different grades.

Grinder (Stone and Clay): tends and feeds grinding machine to grind pieces of rock or clay into fine dust. Adjusts clearance between rollers and bed stone (solid plate) of machine for fineness of grinding required; starts machine and feeds material into machine with shovel breaking loosens clogged material in machine with bar; large pieces with bar or hammer if necessary; regulates water valve to let out requisite water into machine to settle dust. May clean and oil machine.

Reference NCO-2015:

a) 7315.2200 - Crusher Attendant, Stone
b) 7315.2300 - Grinder (Stone and Clay)

4. GENERAL INFORMATION

Name of the Trade	**STONE PROCESSING MACHINE OPERATOR**
NCO - 2015	7315.2200, 7315.2300
NSQF Level	Level-4
Duration of Craftsmen Training	One year (Two semesters each of six months duration)
Entry Qualification	Passed 10th class examination under 10+2 system of education with Science and Mathematics or its equivalent.
Unit Strength (No. Of Student)	20 (Max. Supernumeraries seats: 6)
Space Norms	100 Sq. m
Power Norms	10 KW
Instructors Qualification for	
1. Stone Processing Machine Operator Trade	Degree in Civil/Mining/Electrical /Mechanical/ Metallurgy Engineering from recognized Engineering college/ university with one year experience in relevant field. **OR** Diploma in Civil/Mining/Electrical/ Mechanical/ Metallurgy Engineering from recognized board of technical education with two-year experience in relevant field. **OR** NTC/NAC passed in the relevant trade with three-year post qualification experience in the relevant field. **OR** A person having 8 years practical experience in the field of Stone Processing Machines Operator. **Desirable qualification:** Preference will be given to a candidate with Craft Instructor's Certificate. ***Out of two Instructors required for the unit of 2 (1+1), one must have Degree/Diploma and other must have NTC/NAC qualifications.***
2. Workshop Calculation & Science	Degree in Engineering with one year experience. **OR** Diploma in Engineering with two-year 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-year experience. **OR** NTC/ NAC passed in the Draughtsman (Mechanical / Civil) with three-year experience.
4. Employability Skill	MBA OR BBA with two-year experience OR Graduate in Sociology/ Social Welfare/ Economics with two-year experience OR Graduate/ Diploma with two-year experience and trained in Employability Skills from DGT institutes. **AND** Must have studied English/ Communication Skills and Basic Computer at 12th / 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	Workshop Cal. &Sc.	Engg. Drawing	Employability Skills	Extra-curricular Activity
40 Hours	25 Hours	6 Hours	2 Hours	3 Hours	2 Hours	2 Hours

5. NSQF LEVEL COMPLIANCE

NSQF level for **Stone Processing Machine Operator** 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:

a. Process
b. Professional Knowledge
c. Professional Skill
d. Core Skill
e. Responsibility

The Broad Learning outcome of the **Stone Processing Machine Operator** 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 with 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, elasticity]*
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, Different Projections, Assembly drawing, Sectional views, Estimation of material]*
4. Select 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 execute the work related to the occupation.

6.2. SPECIFIC LEARNING OUTCOME

Semester – I

9. Identify various types of stones, their commercial varieties and different types of textures in stones.
10. Find characteristics of stones, their properties, testing procedures and identify various types of hand tools used in stone processing.
11. Perform simple fitting operations by using various hand tools and marking/ measuring instruments.
12. Prepare electrical wire joints viz., Britannia, straight tee, western union etc. and use electrical measuring instruments & electrician hand tools.

13. Carry out Petrographic analysis of concrete and Physico-Mechanical test on stones for checking compressive strength, impact strength, density, etc.
14. Diagnose & rectify the defects in stone and stone masonry by fixing with cement and lime concrete.
15. Perform Dressing, Cutting, Polishing, Chamfering, Grooving and Loading / Unloading of blocks etc.

Semester – II

16. Perform operation and maintenance of various stone processing machines viz., Circular saw, Multiblade block cutter, Gang saw machine, Polishing machine, Calibrating machine, Edge cutting machine slicing machine, Hydraulic mono blade dresser, etc. with due care and safety.
17. Carry out stone polishing using abrasives for quality finishing on marble.

7. LEARNING OUTCOME WITH ASSESSMENT CRITERIA

GENERIC LEARNING/ ASSESSABLE OUTCOME	
LEARNING/ ASSESSABLE OUTCOME	**ASSESSMENT CRITERIA**
1. Recognize & comply with 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 of 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 withregard 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 and explain different mathematical	2.1 Explain concept of basic science related to the field such as Material science, Mass, weight, density, heat & temperature,

	calculation & science in the field of study including basic electrical. *[Different mathematical calculation & science - Work, Power & Energy, Algebra, Geometry, Mensuration, Trigonometry, Heat & Temperature, elasticity]*	heat treatment.
		2.2 Measure dimensions as per drawing
		2.3 Use scale/ tapes to measure for fitting to specification.
		2.4 Comply with 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.
		2.7 Explain basic electricity, insulation and earthing.
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, Different Projections, Assembly drawing, Sectional views, Estimation of material]*	3.1 Read and interpret the information on drawings and apply in executing practical work.
		3.2 Read & analyse the specification to ascertain the material requirement, tools, and assembly/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 measure dimension of components and record data.	4.1 Select appropriate measuring scale/tape/gauges.
		4.2 Measure dimension of the components/assembly & compare with 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	6.1 Explain the concept of energy conservation, global warming, pollution and utilize the available recourses optimally & remain

warming and pollution and contribute in day-to-day work by optimally using available resources.	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 familiarize 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 execute 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 Execute the task effectively.

SPECIFIC LEARNING/ ASSESSABLE OUTCOMES	
SEMESTER-I	
LEARNING/ ASSESSABLE OUTCOME	**ASSESSMENT CRITERIA**
9. Identify various types of stones, their commercial varieties and different types of textures in stones.	9.1 Ascertain various types stones and their properties.
	9.2 Check the different textures in stones for geology and exploration
	9.3 Identify flaggy limestone, slate granite, sandstone etc.
	9.4 Differentiate between dimensional and decorative stones.
	9.5 Check the commercial varieties of different stones.
	9.6 Economical usage of stones.
	9.7 Evaluate the various textures in stones.
10. Find characteristics of stones, their properties, testing procedures and identify various types of hand tools used in stone processing.	10.1 Find stones as per the methods available.
	10.2 Ascertain the properties of stones.
	10.3 Follow the methods and procedures of testing stones.
	10.4 Enlist the strength, chemical composition and physical characteristics of stones.
	10.5 Identify the various hand tools required for stone processing.
	10.6 Ascertain the safety precautions for handling tools.
	10.7 Prepare the job for chiselling, hammering and filling.
	10.8 Use hand tools of steel rule square, scriber and dividers, centre punch, chisels, hammer, different files, bench vice and hand vice.
11. Perform simple fitting operations by using various hand tools and marking/ measuring instruments.	11.1 Plan & Identify tools, instruments and equipments for marking and make this available for use in a timely manner.
	11.2 Mark as per specification applying desired mathematical calculation and observing standard procedure.
	11.3 Prepare the job for chipping, chiselling, filing, drilling, tapping, making external threads etc.
	11.4 Observe safety procedure during above operation as per standard norms and company guidelines.
	11.5 Avoid waste, ascertain unused materials and components for disposal, store these in an environmentally appropriate manner and prepare for disposal.

12. Prepare electrical wire joints viz., Britannia, straight tee, western union etc. and use electrical measuring instruments and electrician hand tools.	12.1 Identify different electrical equipment viz. Ammeters, Voltmeter, Energy meter etc.
	12.2 Identify electrician hand tools like screw driver, pliers, tester etc.
	12.3 Ascertain safety precautions during operations of electrical hand tools.
	12.4 Identify electrician hand tools like screw-driver, pliers, tester etc.
13. Carry out Petrographic analysis of concrete and Physico-Mechanical test on stones for checking compressive strength, impact strength, density etc.	13.1 Check for compressive strength, impact strength, specific gravity etc for stones.
	13.2 Follow petrographic examination for testing stones
	13.3 Identify dimensions of stone products and their parameters.
	13.4 Observe the physical and chemical properties of stones.
	13.5 Test stones based on their properties for their correct use and marketability.
14. Diagnose & rectify the defects in stone and stone masonry by fixing with cement and lime concrete.	14.1 Check for cracks in stone and stone masonry.
	14.2 Prepare cement concrete proportion and lime concrete.
	14.3 Use the cement concrete proportion and lime concrete to plaster given stone surface.
	14.4 Fix any sorts of defects in stones
	14.5 Ascertain safety measures for doing the repairing job.
15. Perform Dressing, Cutting, Polishing, Chamfering, Grooving and Loading/ Unloading of blocks etc.	15.1 Identify the machineries and techniques for various stone processing operations.
	15.2 Prepare job for lifting/moving block, dressing, chamfering, edge cutting, grooving etc.
	15.3 Plan and execute gantry crane operation.
	15.4 Check functionality of gantry crane
	15.5 Perform unloading & loading block and use AT/CT drive.
SEMESTER-II	
16. Perform operation and maintenance of various stone	16.1 Identify Gang saw with horizontal frame and vertical frame.

	16.2	Prepare machine with rising stone car
	16.3	Prepare job for diamond segment, ingredients, blending, moulding etc.
	16.4	Execute joining of blade end with end tabs with tensioning of blade
	16.5	Operate and maintain diamond gang saw for marble, sandstone and granite with safety measures.
	16.6	Identify hydraulic Mono blade dresser Block.
	16.7	Prepare coolant for removal of the cutting.
	16.8	Operate and maintain Mono blade dresser with safety measures.
	16.9	Prepare job for using circular saw.
	16.10	Check Blade tensioning, setting of the blade, Flanges, Bore, Running true, spindle bearing and multiblade cutter.
	16.11	Maintain safety measures for operation of circular saw.
	16.12	Plan and perform lubrication of grindstone head
	16.13	Check Polishing dressing unit, belt holding plate, Oscillating sector head.
	16.14	Maintain Calibrating machines for easy operations
	16.15	Ensure safety measures while using Calibrating machines.
17. Carry out stone polishing using abrasives for quality finishing on marble.	17.1	Prepare blocks for polishing as per requirements.
	17.2	Check Abrasive no. for using in polishing blocks
	17.3	Check grain structure before polishing blocks.
	17.4	Ensure quality finishing on marble.
	17.5	Operate and maintain Polishing machine with safety measures.

8. SYLLABUS

SYLLABUS - STONE PROCESSING MACHINE OPERATOR			
FIRST SEMESTER - 6 MONTHS			
Week No.	**Reference Learning Outcome**	**Professional Skills (Trade Practical)**	**Professional Knowledge (Trade Theory)**
1	Recognize & comply with safe working practices, environment regulation and housekeeping.	1. Introduction of the trade in the development of Industrial economy of the country. 2. Industrial discipline and working environment. 3. Familiarization with shop layout. 4. Introduction to safety - including fire equipments and their uses. 5. Necessary guidance to be provided to the new corners to become familiar with the working of industrial training institute. 6. Demonstration on elementary first aid, artificial respiration.	**Introduction** Brief introduction about the trade. Environmental aspect of stone industry. Impact of stone industry on environment. Environment and environmental pollutions. Personal safety and occupational health hazards. Importance of safety and general precaution observed in the institute. Various safety measure involved in the industry. Elementary first aid.
2-3	Identify various types of stones, their commercial varieties and different types of textures in stones.	7. Stone-An Introduction. 8. Its types - natural stone, sandstone. 9. Flaggy limestone, slate granite, marble etc. 10. Dimensional and decorative stones. 11. Commercial verities of different stones. 12. Different types of textures in stones	**Geology and exploration** Geology of dimensional stone resources in India: Explanation of the deposits of marble, granite, sandstone, flaggy limestone, slate etc. are occurring in various parts of India Geology and graphical distribution of different dimensional stones deposits in India viz. marble, granite, sandstone, limestone, slate etc. Characteristics of various stones Commercial verities of different stones Textures in different stones Physico mechanical

			properties of stones Chemical properties of various stones Different types of textures in stones
4-5	Find characteristics of stones, their properties, testing procedures and identify various types of hand tools used in stone processing.	13. Methods of finding stone strength, chemical composition and physical characteristics. 14. Tools: use of steel rule, square, scriber and dividers, centre punch, chisels, hammer, different files, bench vice and hand vice.	Properties of stones. Stone testing procedure. Safety precautions and elementary first aid, common hand tools of fitter trade-their name description and material.
6-10	Perform simple fitting operations by using various hand tools and marking/ measuring instruments.	15. Saw, centre punch, filing to line. 16. Filling a work-piece flat and training devices-fixing of mating nut. 17. Locking pins. 18. Hand tools: straight edge bloom bob, square etc. 19. Funner – its use. 20. Chipping, chisels, cold chisel, round nose threading and tapping, dieing, making external threads. 21. To prepare edges of stone on grinding machine and check. 22. Sawing filing to given diffusions-filing true and square notice different types of file operations-marking and clear and blind holes. 23. Opening of twist drills safety points to be observed while operating a drilling machine. 24. Measuring internal and external dimensions by the use of vernier caliper and micrometer.	Description of simple fitting operations, hacks awing, punching and filing. Types of files. Marking instruments and their uses. Use of vernier caliper, micrometer. Method of using drills taps and dies. Description of simple drilling machine-safety precautions-in handling grinding machines. Types of hack saw frames and blades- their selections and uses types of files and their uses. Care and maintenance of files. Types and sizes of drills-cutting angles and speeds of drills calculation of tap drill sizes. Vernier caliper and Micrometer - uses, least count, vernier scale main scale and function of vernier caliper and micrometer.

11-13	Prepare electrical wire joints viz., Britannia, straight tee, western union etc. and use electrical measuring instruments & electrician hand tools.	25. Demonstration of electrician hand tools like screw-driver, pliers, tester and other hand tools. 26. Practice in using cutting pliers, screw driver. 27. Demonstration and practice bare conductor, joints such as Britannia, straight tee, western union joint. 28. Study and use of Ammeters, Voltmeter, Energy meter etc.	Fundamental of electricity. Electron theory-free electron fundamental terms, definition, unit and effects of elastic units. Explanation of electrical measuring instruments Ammeters, Voltmeter, Energy meter only explanation of work, power energy in DC circuit. Identification of electrician hand tools.
14-15	Carry out petrographic analysis of concrete and Physico-Mechanical test on stones for checking compressive strength, impact strength, density, etc.	29. Identifying of the mineral by petrographic examination. 30. Physico-Mechanical Test for selection of natural stone. 31. Checking of compressive strength, impact strength, elastic constant, density / specific gravity.	Introduction to characterization of dimensional stone i.e. marble, granite, sand stone, kota stone (flaggy limestone), slate etc. for their correct use & marketability. Application of all dimensions stone products and their parameter. Introduction to petrographic, physical and mechanical properties of stones, testing of stones etc.
16-18	Diagnose & rectify the defects in stone and stone masonry by fixing with cement and lime concrete.	32. To repair crakes in stone, stone masonry and knowledge to pointing out the defects. 33. To prepare cement concrete proportion and lime concrete to plaster given stone surface and fixing of stones.	Defect in stones and their repair, precaution to be taken in stone fixing, restoration and conservation, merit and demerits in stone masonry / uses Concepts of water cement ratio work ability. Tools required for fixing, and repairing of stones and for plastering.

19-22	Perform Dressing, Cutting, Polishing, Chamfering, Grooving and Loading / Unloading of blocks etc.	34. Demonstration and Practice on lifting/moving block. 35. Dressing, Cutting/sawing, Calibrating, Polishing, Edge cutting, Chamfering, Grooving. 36. Practice on Block handling, Uses of unloading & loading the block, Uses of AT drive/CT drive.	Introduction to Flow chart of processing plant. Explanation of each block and operating principle. Construction and Working principle of Gantry crane. Types of gantry crane as per capacity. Explanation of major parts and their working procedure. Maintenance procedure of Gantry crane.
23-24	**Project Work/ Industrial Visit-** **Broad Area:** a) Basic fitting operations b) Petrographic analysis of concrete c) Physico-mechanical tests		
25	**Revision**		
26	**Examination**		

Note: -

1. *Some of the sample project works (indicative only) are given against each semester.*
2. *Instructor may design their own project and also inputs from local industry may be taken for designing such new project.*
3. *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.*
4. *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 FOR STONE PROCESSING MACHINE OPERATOR TRADE			
SECOND SEMESTER – 06 Months			
Week No.	**Learning Outcome Reference**	**Professional Skills (Trade Practical)**	**Professional Knowledge (Trade Theory)**
27-29	Perform operation and maintenance of various stone processing machines viz., Circular saw, Multiblade block cutter, Gang saw machine, Polishing machine, Calibrating machine, Edge cutting machine slicing machine, Hydraulic mono blade dresser, etc. with due care and safety.	37. Demonstration and Practice on of Gang saw with horizontal frame, Machine with rising stone car, Gang saw with vertical frame. 38. Diamond segment, Ingredients, Blending, Moulding, Sintering, Deburing. 39. Down feed, Step of manufacturing gang saw blade- Cutting blade. 40. Joining of blade end with end tabs. 41. Tensioning of blade, Brazing of diamond segment on blades. 42. Checking of blade for any error. 43. Fixing/mounting the blade in frame. 44. Camber for gang saw blade. Trolley loading.	Construction and Working principle of diamond gang saw/steel gang saw. Types of diamond gang saw as per capacity. Explanation of major parts and their working procedure. Maintenance procedure of diamond gang saw for marble, sandstone and granite). Concept of Trolley loading principles.
30-47	-Do-	45. Demonstration and practice of hydraulic mono blade dresser Block to be dressed. 46. Uses as coolant as well as removal of the cutting. 47. Demonstration and Practice on circular saw – Construction, Blade tensioning, Setting of the Blade, Flanges, Bore, Running true, Parallelism, Spindle bearing play, Cutting parameters, Multiblade block cutter.	Construction and Working principle of Mono blade dresser, Types of Mono blade dresser as per capacity. Explanation of major parts and their working procedure. Maintenance procedure of Mono blade dresser. Construction and Working principle of Circular saws, Types of Circular saws as per capacity. Explanation of major parts and their working procedure.

		48. Demonstration and Practice on line polishing m/c – Construction, Fixed steel beams, Heads, Cross beam travelling speed, Guide unit for slabs, Automatic polishing compound dispenser, Polishing dressing unit, Belt holding plate, Oscillating sector head, Lubrication of the grindstone head, Pneumatic system, Hydraulic system, Water system, Safety device. 49. Demonstration and practice on calibrating machine- sawn strips, types of strips and uses of strips. 50. Demonstration and Practice on Edge cutting/cross cutting machine-Sizing, chamfering & Grooving 51. Demonstration and Practice on Slicing machine- Sizing block of marble as horizontally, Reverse & Forward, Chamfering & Grooving	Maintenance procedure of Circular saws. Construction and Working principle of Polishing machine, Types of Polishing machine as per capacity. Explanation of major parts and their working procedure. Maintenance procedure of Polishing machine Construction and Working principle of Calibrating machine, Types of Calibrating machine as per capacity. Explanation of major parts and their working procedure. Maintenance procedure of Calibrating machine. Construction and Working principle of Edge cutting/cross cutting machine, Types of Edge cutting machine as per capacity. Explanation of major parts and their working procedure. Maintenance procedure of Edge cutting/cross cutting machine. Construction and Working principle of Slicing machine, Types of Slicing machine as per capacity. Explanation of major parts and their working procedure. Maintenance procedure of Slicing machine.
48	Carry out stone polishing using abrasives for quality finishing on marble.	52. Demonstrations and operation of polishing sizing block. 53. Uses as abrasives No. and grain structure as per quality finishing on marble.	Construction and Working principle of Abrasive, Different types of abrasive and their working recommendation numbers as per stone polishing.
49-50	**In-plant training / Project work**		

	Visit to stone mines to study the construction and operation of the machines.
51	**Revision**
52	**Examination**

9. SYLLABUS - CORE SKILLS

9.1 WORKSHOP CALCULATION SCIENCE & ENGINEERING DRAWING

First Semester **Duration: Six Months**		
S No.	**Workshop Calculation and Science**	**Engineering Drawing**
1.	**Unit**: Systems of unit- FPS, CGS, MKS/SI unit, unit of length, Mass and time, Conversion of units	Engineering Drawing: Introduction and its importance - Relationship to other technical drawing types - Conventions - Viewing of engineering drawing sheets. - Method of Folding of printed Drawing Sheet as per BIS SP:46-2003
2.	**Fractions**: Fractions, Decimal fraction, L.C.M., H.C.F., Multiplication and Division of Fractions and Decimals, conversion of Fraction to Decimal and vice versa. Simple problems using Scientific Calculator.	Drawing Instruments: their Standard and uses - Drawing board, T-Square, Drafter (Drafting M/c), Set Squares, Protractor, Drawing Instrument Box (Compass, Dividers, Scale, Diagonal Scales etc.), Pencils of different Grades, Drawing pins/ Clips.
3.	**Square Root**: Square and Square Root, method of finding out square roots, Simple problem using a calculator.	Lines : - Definition, types and applications in Drawing as per BIS SP:46-2003 - Classification of lines (Hidden, center, construction, Extension, Dimension, Section) - Drawing lines of a given length (Straight, curved) - Drawing of parallel lines, perpendicular line - Methods of Division of line segment
4.	**Ratio &Proportion**: Simple calculation on related problems.	Freehand drawing of - Lines, polygons, ellipse, etc. - Geometrical figures and blocks with dimension Transferring measurement from the given object to the free hand sketches.
5.	**Percentage**: Introduction, Simple calculation. Changing percentage to fraction and	Lettering and Numbering as per BIS SP46-2003: - Single Stroke, Double Stroke, inclined, Upper case and Lower case. Dimensioning: Definition, types and methods of dimensioning

	decimal & vice-versa.	(functional, non-functional and auxiliary), Types of arrowhead - Leader Line with text
6.	**Material Science**: Properties-Physical & Mechanical, Types–Ferrous & Non-Ferrous, difference between Ferrous and Non-Ferrous metals, introduction of wood (Iron), Cast Iron, Wrought Iron, Steel, difference between Iron and Steel, Alloy steel, carbon steel, stainless steel, Non-Ferrous Alloys.	Drawing of Geometrical Figures: Definition, nomenclature and practice of: - Angle: Measurement and its types, method of bisecting. - Triangle -different types - Rectangle, Square, Rhombus, Parallelogram. - Circle and its elements.
7.	**Mass, Weight and Density**: Mass, Unit of Mass, Weight, difference between mass and weight. Density, unit of density. Relation between mass, weight & density. Simple problems related to mass, weight, and density.	Sizes and Layout of Drawing Sheets - Basic principle of Sheet Size - Designation of sizes - Selection of sizes - Title Block, its position and content - Borders and Frames (Orientation marks and graduations) - Grid Reference - Item Reference on Drawing Sheet (Item List)
8.	**Speed and Velocity**: Rest and motion, speed, velocity, difference between speed and velocity, acceleration, retardation, equations of motions, simple related problems.	Method of presentation of Engineering Drawing - Pictorial View - Orthographic View - Isometric view
9.	**Work, Power and Energy**: work, unit of work, power, unit of power, Horsepower of engines, mechanical efficiency, energy, use of energy, potential and kinetic energy, examples of potential energy and kinetic energy.	Symbolic Representation used in the related trade (as per BIS SP:46-2003) of: - Fastener(Rivets, Bolts and Nuts) - Bars and profile sections - Weld, brazed and soldered joints. - Electrical and electronics element - Piping joints and fittings
Second Semester **Duration: Six Month**		
1.	**Basic Algebra**: Addition, Subtraction, Multiplication, Division, Algebraic formula, Linear equations (with two variables).	Construction of Scales and diagonal scale

2.	**Mensuration:** Area and perimeter of square, rectangle, parallelogram, triangle, circle, semicircle Volume of solids – cube, cuboid, cylinder and Sphere. Surface area of solids – cube, cuboid, cylinder and Sphere.	**Dimensioning practice:** - The position of dimensioning (unidirectional, aligned, as per BIS SP:46-2003) Symbols preceding the value of the dimension and dimensional tolerance.
3.	**Trigonometry:** Trigonometrical ratios, measurement of angles. Trigonometric tables	Drawing of Solid figures (Cube, Cuboids, Cone, Prism, Pyramid, Frustum of Cone and Pyramid.) with dimensions. Drawing of Solid figures (Prism, Pyramid, Frustum of Cone and Pyramid.) with dimensions.
4.	**Elasticity:** Elastic & Plastic material. Stress & strain and their units. Young's modulus. Ultimate stress and breaking stress.	Free Hand sketch of hand tools and measuring tools used in the respective trades.
5.	**Heat & Temperature**: Heat and temperature, their units, difference between heat and temperature, boiling point, melting point, Scale of temperature, relations between different scale of temperature. Thermometer, pyrometer. Transmission of heat, conduction, convection, radiation. Thermal Conductivity, Heat loss and heat gain.	**Projections:** - Concept of axes plane and quadrant. - Orthographic projections - Method of first angle and third angle projections (definition and difference) - Symbol of 1st angle and 3rd angle projection as per IS specification.
6.	**Basic Electricity**: Introduction, use of electricity, how electricity is produced, Types of current_ AC, DC, their comparison, voltage, resistance, and their units. Conductor, insulator, Types of connections – series, parallel, electric power, Horsepower, energy, unit of electrical energy. - Electrical insulating materials. - Basic concept of earthing.	Drawing of Orthographic projection in 3rd angle.

7.	**<u>Levers and Simple Machines</u>:** Levers and its types. Simple Machines, Effort and Load, Mechanical Advantage, Velocity Ratio, Efficiency of machine, Relationship between Efficiency, velocity ratio and Mechanical Advantage.	Drawing of simple fastener (Rivet, Bolts, Nuts & Screw) - Riveted Joints-Butt & Lap (Drawing one for each type).
8.	- Area of irregular surfaces. - Application related to shop problems.	Free hand sketching of simple objects related to trade.
9.	- Material weight and costing - problems related to trade.	- Reading of drawing. Simple exercises related to missing lines, dimensions. How to make queries. - Simple exercises relating missing symbols. - Missing views
10.	- Heat treatment and its necessity.	- Concept of preparation of assembly drawing and detailing. Preparation of simple assemblies & their details of trade related job/exercises with the dimensions from the given sample or models.
11.	-	Reading of fabricated engineering drawing

9.2 EMPLOYABILITY SKILLS

CORE SKILL – EMPLOYABILITY SKILL		
First 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 known people, 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 on messages and filling in message forms, Greeting and introductions, office hospitality, Resumes or curriculum vita essential parts, letters of application reference to previous communication.	
2. IT Literacy		**Duration : 20 hrs** **Marks : 09**
Basics of Computer	Introduction, Computer and its applications, Hardware and peripherals, Switching on-Starting and shutting down of the 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, WebsSite, 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
Second 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. Difference between small scale &large scale business, Market survey, Method of marketing, Publicity and advertisement, Marketing mix.
Institution's 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 familiarize 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 it improves or slows down productivity.
Comparison with Developed Countries	Comparative productivity in developed countries (viz. Germany, Japan and Australia) in select 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 hygiene, 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 housekeeping, Practice of good housekeeping.

Quality Tools	Basic quality tools with a few examples.

ANNEXURE-I

LIST OF TOOLS AND EQUIPMENT			
STONE PROCESSING MACHINE OPERATOR (For batch of 20 trainees)			
A. TRAINEES TOOL KIT (For each additional unit, trainees tool kit S no. 1-20 is required additionally)			
S No.	**Name of the Tool & Equipment**	**Specification**	**Quantity**
1.	Steel Rule	300 mm	21 Nos.
2.	Try Square	150 mm	21 Nos.
3.	Spring caliper, out side	150 mm	21 Nos.
4.	Spring caliper, in side	150 mm	21 Nos.
5.	Caliper, hermaphrodite	150 mm	21 Nos.
6.	Spring divider	150 mm	21 Nos.
7.	Scriber	150 mm	21 Nos.
8.	Centre punch	100 mm	21 Nos.
9.	Dot punch	100 mm	21 Nos.
10.	Chisel flat cold	20 mm	21 Nos.
11.	Chisel cross cut	20 mm	21 Nos.
12.	Hammer ball pein	500 gram	21 Nos.
13.	Hammer cross pein	250 gm	21 Nos.
14.	File flat Bastard	250 mm	21 Nos.
15.	File flat second cut	200 mm	21 Nos.
16.	File smooth	200 mm	21 Nos.
17.	Hacksaw frame adjustable	250-300 mm	21 Nos.
18.	Scraper flat	150 mm	21 Nos.
19.	Scraper half round	150 mm	21 Nos.
20.	Scraper triangular	150 mm	21 Nos.
B. General Shop Outfit			
21.	Bench vise	120 mm	10 Nos.
22.	Vernier micrometer outside	0 to 25 mm	02 Nos.
23.	Dial micrometer outside	50 to 75 mm	02 Nos.

24.	Vernier calipers	200mm	02 Nos.
25.	Vernier height gauge	300 mm	02 Nos.
26.	Inside micrometer	50 mm to 100	02 Nos.
27.	Depth micrometer	0 to 100 mm with extension	02 Nos.
28.	Taps and dies course series	6 to 25 mm	02 Set
29.	Surface plate	400 and 400 mm grade 2 mm	02 Nos.
30.	Universal marking block		02 Nos.
31.	Wooden Straight Edge	300, 600, 900, 1200 mm	20 Nos.
32.	Pick Axes		02 Nos.
33.	Bar Bending Tools and Cutting Tools		02 Nos.
34.	Four Fold Foot Rule		04 Nos.
35.	Plumb Bob		02 Nos.
36.	Mason to Plaster work		20 Nos.
37.	Neon Tester	500 Volts	04 Nos.
38.	Test lamp	200 volt 25 watt	04 Nos.
39.	Hand techometer with male and female above rubber plug resin case		02 Nos.
40.	Moving iron and ammeter portrable type		02 Nos.
41.	Multimeter (AVO)		02 Nos.
42.	Insulator screw driver	150 mm, 200 mm	20 Nos.
43.	Insulator combination cutting plier	200 mm side	04 Nos.
44.	Connector	100 mm	04 Nos.
C. General Machinery			
45.	Drilling Machine	0 to 200 mm Capacity Motorised with Chuck and key	01 Set
46.	Drill HSS	6mm to 12 mm in steps of 1 mm	02 Set
47.	Drill Angle Gauge		02 Set
48.	Drilling Machine Motorized pillar	20 mm Capacity	01 Set
49.	Steel Tape one Meter		01 No.
50.	Direct Reading vernier caliper	200 mm	01 No.
51.	Hydraulic Jack		01 No.

52.	Mobile Crane		01 No.
53.	Front end loader		01 No.
54.	Power Generator		01 No.
55.	Air Compressor		01 No.
56.	Gang saw Machine		01 No.
57.	Stripping Machine		01 No.
58.	Calibrating Machine		01 No.
59.	Polishing Machine		01 No.
60.	Champhring Machine		01 No.
61.	Artificial respirator		04 Nos.
C. Furniture and teaching aids			
62.	Wall charts		10 Nos.
63.	LCD projector		01 No.
64.	WHITE Board		01 No.
65.	Adjustable steel Pointer		02 Nos.
66.	Dual desk		10 Nos.
67.	Instructor Table		01 No.
68.	Instructor chair		01 No.
69.	Almirah (cup board)		02 Nos.
70.	Steel rack		02 Nos.
71.	Computer table		02 Nos.
72.	Computer chair		04 Nos.
73.	Lockers with 8 Drawers (standard size)		03 Nos.
74.	Water dispenser		01 No.
D. Computer hardware and software			
75.	Computer with latest configuration		10 Nos.
76.	Laser Printer (B/W)		01 No.
77.	Scanner		01 No.
78.	Software package for stone design (latest version) educational version		01 No.
79.	Designing books and CD		As required

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	01 No.
4.	Computer Tables	10 Nos.
5.	Computer Chairs	20 Nos.
6.	LCD Projector	01 No.
7.	White Board 1200mm x 900mm	01 No.
Note: Above Tools & Equipment not required, if Computer LAB is available in the institute.		

ANNEXURE-II

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:														
SNo	**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														