**CURRICULUM**

**FOR THE TRADE OF**

# CERAMIC MOULDER

**UNDER**

**APPRENTICESHIP TRAINING SCHEME**

सत्यमेव जयते
Government of India

**GOVERNMENT OF INDIA**
**MINISTRY OF SKILL DEVELOPMENT& ENTREPRENURESHIP**
**DIRECTORATE GENERAL OF TRAINING**

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# 1. ACKNOWLEDGEMENT

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1. Atlas Industries
2. AntrixSanitarywares
3. The P. P. W. Co. Ltd., Morbi
4. YogideepCera& Co.

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**Co-ordinator for the course:** Sh. NirmalyaNath., ADT

| Sl. No. | Name & Designation Sh./Mr./Ms. | Organization | Expert Group Designation |
|---|---|---|---|
| **1.** | HavadiyaRamniklal R. | YogideepCera& Co. | Expert |
| **2.** | Patel Jaswantbhai P. | Atlas Industries | Expert |
| **3.** | AndarpaPrakash M. | AntrixSanitarywares | Expert |
| **4.** | P. B. Jadeja | The P. P. W. Co. Ltd., Morbi | Expert |
| **5.** | R.J. Kaila | ITI Morbi | Expert |

# 2. BACKGROUND

## 2. 1. Apprenticeship Training Scheme under Apprentice Act 1961

The Apprentices Act, 1961 was enacted with the objective of regulating the programme of training of apprentices in the industry by utilizing the facilities available therein for imparting on-the-job training. The Act makes it obligatory for employers in specified industries to engage apprentices in designated trades to impart Apprenticeship Training on the job in industry to school leavers and person having National Trade Certificate(ITI pass-outs) issued by National Council for Vocational Training (NCVT) to develop skilled manpower for the industry**.** There are four categories of apprentices namely**; trade apprentice, graduate, technician and technician (vocational) apprentices.**

Qualifications and period of apprenticeship training of **trade apprentices** vary from trade to trade. The apprenticeship training for trade apprentices consists of basic training followed by practical training. At the end of the training, the apprentices are required to appear in a trade test conducted by NCVT and those successful in the trade tests are awarded the National Apprenticeship Certificate.

The period of apprenticeship training for graduate (engineers), technician (diploma holders and technician (vocational) apprentices is one year. Certificates are awarded on completion of training by the Department of Education, Ministry of Human Resource Development.

## 2. 2. Changes in Industrial Scenario

Recently we have seen huge changes in the Indian industry. The Indian Industry registered an impressive growth during the last decade and half. The number of industries in India have increased manifold in the last fifteen years especially in services and manufacturing sectors. It has been realized that India would become a prosperous and a modern state by raising skill levels, including by engaging a larger proportion of apprentices, will be critical to success; as will stronger collaboration between industry and the trainees to ensure the supply of skilled workforce and drive development through employment. Various initiatives to build up an adequate infrastructure for rapid industrialization and improve the industrial scenario in India have been taken.

## 2. 3. Reformation

The Apprentices Act, 1961 has been amended and brought into effect from 22$^{nd}$ December, 2014 to make it more responsive to industry and youth. Key amendments are as given below:

- Prescription of number of apprentices to be engaged at establishment level instead of trade-wise.

- Establishment can also engage apprentices in optional trades which are not designated, with the discretion of entry level qualification and syllabus.

- Scope has been extended also to non-engineering occupations.

- Establishments have been permitted to outsource basic training in an institute of their choice.

- The burden of compliance on industry has been reduced significantly.

# 3. RATIONALE

(Need for Apprenticeship in **Ceramic Moulder**trade)

1. Operate ceramic molding and casting machines.
2. Mold and ceramic or thermoplastic parts.
3. Design and develop new molds, molding processes, techniques, process
4. Improvements and cost reductions.
5. Develop and document manufacturing instructions and data sheets.
6. Operate compression or injection molding machines.
7. Mix catalysts and coloring pigments.
8. Operate mixing machine.
9. Repair and maintain machines.
10. Cut off excess material.
11. Grind scraps into powder.
12. Read specifications to determine setup and prescribed temperature and time settings.
13. Pour product into mold.
14. Remove cured product from mold.
15. Inspect products for surface defects and flaws.
16. Ensure conformance to specifications.
17. Position and secure assembled mold and mold components.
18. Put dies into machine.
19. Coat dies with parting agent.
20. Eliminate production of defective parts and products.
21. Weigh compounds and pour compounds into die well.
22. Fill machine hoppers.
23. Regulate molding temperature, volume, pressure, and time.
24. Activate machine to inject dies.
25. Attach connecting lines.

# 4. JOB ROLES: REFERENCE NCO

**Brief description of Job roles:**

**Moulder, Hand (Ceramics)** makes ceramic articles such as sanitary wares; abrasive wheels, bricks, tiles, etc. by pressing moist clay by hand in plaster of Paris or Wooden (Bihar) moulds and moulding it to desired shape or form. Kneads moist clay with hands and feet or by shood (Bihar) to give it required consistency or plasticity; applies thin coating of oil or clay dust or both, inside mould to prevent moist clay sticking to surface when filled; presses clay firmly into mould byhand, with mallet or by means of ramming tool to pack mould uniformly; scraps off projecting clay with sharp instrument to give moulded article smooth edge; allows clay to remain in mould for short time to dry and shrink slightly; removes semidry ware from mould and places it in drying chamber, after checking defects, to form and shape. May specialize in particular
branch, i.e. figures, tea pots, sanitary wares, etc.

Plan and organize assigned work and detect & resolve issues during execution. Demonstrate possible solutions and agree tasks within the team. Communicate with required clarity and understand technical English. Sensitive to environment, self-learning and productivity.

Perform TPM (Total Production Management), TQM (Total Quality Management) and record keeping system.

Reference NCO:

i) **NCO-2004: 7321.25**

# 5. GENERAL INFORMATION

1. **Name of the Trade** **: CERAMIC MOULDER**

2. **N.C.O. Code No.** : **NCO-2004:**7321.25

3. **Duration of Apprenticeship Training**

**(Basic Training + Practical Training) : 15 Months**

3.1 **For Freshers: -**Duration of Basic Training: -

a) Block –I : 3 months

Total duration of Basic Training: **3 months**

Duration of Practical Training (On -job Training): -

a) Block–I: 12 months

Total duration of Practical Training: **12 months**

3.2 **For ITI Passed: -** Duration of Basic Training: - **NIL**

Duration of Practical Training (On -job Training): **12 months**

4. **Entry Qualification** **:**8th class passed.

5. **Selection of Apprentices** **:** The apprentices will be selected as per Apprenticeship Act amended time to time.

6. **Rebate for ITI passed trainees** **:**NIL

*Note: Industry may impart training as per above time schedule for different block, however this is not fixed. The industry may adjust the duration of training considering the fact that all the components under the syllabus must be covered. However the flexibility should be given keeping in view that no safety aspects is compromised.*

**# the 3months basic training common to the trades of i) Ceramic Caster, ii) Ceramic Moulder & iii) Moulder Refractory)**

# 6. COURSE STRUCTURE

**Training duration details: -**

| Time (in months) | 1-3 | 4-15 |
|---|---|---|
| **Basic Training** | **Block– I** | **-----** |
| **Practical Training (On - job training)** | **----** | **Block – I** |

| **Components of Training** | **Duration of Training in Months** ➡ | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ⬇ | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| **Basic Training Block - I** | | | | | | | | | | | | | | | |
| **Practical Training Block - I** | | | | | | | | | | | | | | | |

# 7. SYLLABUS

## 7.1 BASIC TRAINING
## (BLOCK – I &II)
## DURATION: 06 MONTHS

### GENERAL INFORMATION

1) **Name of the Trade** :**CERAMIC MOULDER**
2) **Hours of Instruction** : 1000 Hrs. (500 hrs. in each block)
3) **Batch size** : 20
4) **Power Norms** : 13.6 KW for Workshop
5) **Space Norms** : 130 Sq. m.
6) **Examination** : The internal assessment will beheld on completion of each Block.
7) **Instructor Qualification** :

**i)** Degree/Diploma in Mechanical/Ceramic/MetallurgyEngg. from recognized university/Board with one/two year post qualification experience respectively in the relevantfield.

**OR**

**ii)** NTC/NAC in the trade of **Ceramic Moulder** with three year post qualificationexperience in the relevant field.

Preference will be given to a candidate with Craft Instructor Certificate (CIC)

8) **Tools, Equipments & Machinery required**: - As per Annexure – I

## 7.1.1 DETAILSYLLABUS OF CORE SKILL

## Block– I
## Basic Training

| Sl.No. | Workshop Calculation and Science | Duration (hrs.) | Engineering Drawing | Duration (hrs.) |
|---|---|---|---|---|
| 1. | **Unit**: Systems of unit- FPS, CGS, MKS/SI unit, unit of length, Mass and time, Conversion of units | 20 | Introduction to Engineering Drawing and Drawing Instruments :<br>- Conventions<br>- Viewing of engineering drawing sheets.<br>- Method of Folding of printed Drawing Sheet as per BIS SP:46-2003<br>- 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. | 30 |
| 2. | **Basic Mathematics** - BODMAS rule Fraction-Addition, Subtraction, multiplication and Division-Problem solving, Decimal-Addition.<br>Simple calculation using Scientific Calculator. | | Lines :<br>- Definition, types and applications in Drawing as per BIS SP:46-2003<br>- Classification of lines (Hidden, centre, construction, Extension, Dimension, Section)<br>- Drawing lines of given length (Straight, curved)<br>- Drawing of parallel lines, perpendicular line<br>- Methods of Division of line segment | |
| 3. | Conversion of Fraction to Decimal and vice-versa. | | Free hand drawing of<br>- Lines, polygons, ellipse, etc.<br>- geometrical figures and blocks withdimension<br>Transferring measurement from the | |

| | | | | |
|---|---|---|---|---|
| | | | given object to the free hand sketches. | |
| 4. | **Percentage**: Introduction, Simple calculation.<br>Changing percentage to fraction and decimal & vice-versa. | | Drawing of Geometrical Figures: Definition, nomenclature and practice of<br>- Angle: Measurement and its types, method of bisecting.<br>- Triangle -different types<br>- Rectangle, Square, Rhombus, Parallelogram.<br>- Circle and its elements. | |
| 5. | **Material Science** : Definition, properties (physical & mechanical) and uses of Metal, Non-metal, Alloy &Insulator.<br>Types of ferrous and Non-ferrous metals.<br>Difference between Ferrous and Non-Ferrous metals. | | Sizes and Layout of Drawing Sheets<br>- Selection of sizes<br>- Title Block, its position and content<br>- Item Reference on Drawing Sheet (Item List) | |
| 6. | **Mass, Weight and Density**: Mass, Unit of Mass, Weight, difference between mass and weight.<br>Density, unit of density. Relation between mass, weight & density.<br>Simple problems related to mass, weight, and density. | | Method of presentation of Engineering Drawing<br>- Pictorial View<br>- Orthographic View<br>- Isometric view | |
| 7. | **Mensuration :**<br>Area and perimeter of square, rectangle, parallelogram, triangle, circle, semi circle,<br>Volume of solids – cube, cuboid, cylinder and Sphere.<br>Surface area of solids – cube, cuboid, cylinder | | - Drawing of Solid figures (Cube, Cuboids, Cone) with dimensions. | |

| | | | | |
|---|---|---|---|---|
| | and Sphere. | | | |
| 8. | **<u>Elasticity:</u>**<br>Elastic & Plastic material. Stress & strain and their units. Young's modules. Ultimate stress and breaking stress. | | Free hand Drawing of Solid figures (Prism, Pyramid, Frustum of Cone and Pyramid.) with dimensions. | |
| 9. | **Heat & Temperature**:<br>Heat and temperature, their units, difference between heat and temperature, boiling point, melting point,<br>Scale of temperature, relation between different scale of temperature.<br>Thermometer, pyrometer.<br>Transmission of heat, conduction, convection, radiation. | | Free Hand sketch of hand tools and measuring tools used in respective trades. | |
| 10. | **Basic Electricity:**<br>Introduction and use of Electricity.<br>AC, DC & their comparisons.<br>Current, Voltage,Resistance& their units.<br>Power, Energy & their units.<br>Insulator and conductors & their uses. | | Projections:<br>- Concept of axes plane and quadrant.<br>- Orthographic projections<br>- Method of first angle and third angle projections (definition and difference)<br>- Symbol of 1st angle and 3rd angle projection as per IS specification. | |
| 11. | **-----** | | Drawing of Orthographic projection in 3rd angle. | |

## 7.1.2DETAIL SYLLABUS OF PROFESSIONAL SKILLS & PROFESSIONAL KNOWLEDGE

### A. Block –I

### Basic Training

| Week No. | Professional Skills | Professional Knowledge |
|---|---|---|
| 1. | Safety: - its importance, classification, personal, general, workshop and job safety.<br>Occupational health and safety.<br>Basic injury prevention, Basic first aid, Hazard identification and avoidance, safety signs for Danger, Warning, caution & personal safety message.<br>Preventive measures for electrical accidents & steps to be taken in such accidents.<br><br>Importance of housekeeping & good shop floor practices.<br>Disposal procedure of waste materials like cotton waste, metal chips/burrs etc.<br>Fire& safety: Use of Fire extinguishers. | Importance of safety and general precautions observed in the in the industry/shop floor. All necessary guidance to be provided to the new comers to become familiar with the working of Institute system including stores procedures.<br><br>Introduction of First aid. Safety attitude development of the trainee by educating him to use Personal Protective Equipment (PPE).<br>Response to emergencies eg; power failure, fire, and system failure.<br>Accidents- Definition types and causes.<br>First-Aid, nature and causes of injury and utilization of first-aid.<br><br>Introduction to 5S concept & its application.<br>Fire: - Types, causes and prevention methods.<br>Fire Extinguisher, its types.<br>Global warming its causes and remedies.<br>Industrial Waste its types, sources and waste Management. |
| 2. | Identification of common ceramic raw materials.<br>Familiarisation with the common tools & equipment.<br>Familiarisation with the common ceramic machineries, kilns and furnace etc.<br>Marking out from drawing using scales, dividers, Scribers etc.<br>Practice on the fundamental manufacturing process of ceramic articles. | Different type of raw materials used in ceramic industries- China clays, fire clays, ball clays, feldspar, quartz, limestone, sillimanie, kyamite, chemicals, colouring oxides etc. Visual selection of the raw materials.<br><br>Classification of ceramic bodies: Common clays (terracotta), Stoneware. Earthenware Faiences, Semi-porcelain, Vitreous china, Hotel china, Bone china etc. |
| 3. | Maintenance of tool, cleaning, sharpening, protecting etc.<br>Making and use of templates.<br>Fitting of studs and removal of broken ones, fitting and replacement of dowels.<br>Fitting of vee, flat and endless belts, jointing of | Basic Knowledge about functioning of important machineries like Jaw crusher, Edge runner mill, Ball mill, Blunger, Fitter pump and press.<br>Basic Knowledge about functioning of important machineries like De-airing pug mill |

| | | |
|---|---|---|
| | belts. | ,Jigger & Jolly.<br>Introduction of simple repair and maintenance of pumps and presses.<br>Introduction to preventive maintenance. |
| 4. | Simple pipe fitting.<br>Fitting of guards and safety devices.<br>Calcinations of Quartz.<br>Grinding and crushing of feldspar, quartz etc. | Basic Knowledge about functioning of important machineries like Vibratory Screen Toggle Press, Extrusion Press.<br>Basic Knowledge about functioning of important machineries like High duty refractory presses like Screw and hydraulic refractory presses, semi-automatic and automatic machines. |
| 5. | Charging of blunger.<br>Wet-grinding of raw materials in ball mill. | Pottery and refractory Driers- different types Driers and their mechanism of drying. |
| 6. | Magnetic separation of iron particles.<br>Preparation of clay for casting and pressing.<br>Operation of jigger and jolly. | Different kiln furniture like saggers, setters, stilts, cranks, thimbles, and deck slabs, cantilevers etc, their uses. |
| 7. | Simple casting, jointing and finishing.<br>Drying Pressing.<br>Drying and glazing. | Furnaces- types of kilns and classification of furnaces. Intermittent and continuous kilns like Down draft kiln, Chamber kiln, Tunnel kiln fired by solid, liquid, gaseous fuel and electricity. Kiln and furnace instrumentation (reading of instruments). |
| 8-9. | Preparation of sagger mixture- pressing of saggers. Hand making of saggers. Drying of saggers. Placing of wares in saggers. Placing of saggers in the kiln. Application of colours and different decoration and art. | Pottery Glaze and Decoration – under glaze, in-glaze, in- glaze and on- glaze decoration and methods of application hand drawing, lithographic transier and printing etc. |
| 10. | Making of refractory moulds.<br>Shaping of refractory by hand moulding. | Ceramic Fabrication process like Extrusion, Throwing, Turning, Casting, Jiggering, Pressing etc. |
| 11-12. | Operation of tile presses.<br>Operation of insulator making machine.<br>Operation of kilns, Down Draft, Chamber, Tunnel, Decorating etc. | |
| 13. | **Revision & Internal Assessment** | |

# 7.1.3 EMPLOYABILITY SKILLS

## GENERAL INFORMATION

| | | | |
|---|---|---|---|
| 1) | **Name of the subject** | **:** | **EMPLOYABILITY SKILLS** |
| 2) | **Applicability** | **:** | ATS- Mandatory for fresher only |
| 3) | **Hours of Instruction** | **:** | **55Hrs.** |
| 4) | **Examination** | **:** | The examination will be held at the end of two years Training by NCVT. |
| 5) | **Instructor Qualification** | **:** | |

**i) MBA/BBA with two years experience or graduate in sociology/social welfare/Economics with two years experience and trained in Employability skill from DGET Institute.**

**And**

**Must have studied in English/Communication Skill and Basic Computer at 12th /diploma level**

**OR**

**ii) Existing Social Study Instructor duly trained in Employability Skill from DGET Institute.**

## 7.1.3.1 SYLLABUS OF EMPLOYABILITY SKILLS

### Block – I
### Basic Training

| Topic No. | Topic | Duration (in hours) |
|---|---|---|
| | **English Literacy** | **7** |
| **1.** | **Reading**<br>Reading and understanding simple sentences about self, work and environment | |
| **2.** | **Writing**<br>Construction of simple sentences Writing simple English | |
| **3.** | **Speaking / Spoken English**<br>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. 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. | |
| | **I.T. Literacy** | **10** |
| **1.** | **Basics of Computer**<br>Introduction, Computer and its applications, Hardware and peripherals, Switching on-Starting and shutting down of computer. | |
| **2.** | **Word processing and Worksheet**<br>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.<br>Basics of Excel worksheet, understanding basic commands, creating simple worksheets, understanding sample worksheets, use of simple formulas and functions, Printing of simple excel sheets.<br>Use of External memory like pen drive, CD, DVD etc, | |
| **3.** | **Computer Networking and INTERNET**<br>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. | |
| | **Communication Skill** | **18** |
| **1** | **Introduction to Communication Skills**<br>Communication and its importance<br>Principles of Effective communication<br>Types of communication - verbal, non verbal, written, email, talking on phone.<br>Non verbal communication - components-Para-language<br>Body - language<br>Barriers to communication and dealing with barriers. | |
| **2** | **Listening Skills**<br>Listening-hearing and listening, effective listening, barriers to effective listening guidelines for effective listening. | |
| **3** | **Motivational Training**<br>Characteristics Essential to Achieving Success<br>The Power of Positive Attitude | |

| | | |
|---|---|---|
| | Self-awareness<br>Importance of Commitment<br>Ethics and Values<br>Ways to Motivate Oneself<br>Personal Goal setting and Employability Planning. | |
| **4** | **Facing Interviews**<br>Manners, Etiquettes, Dress code for an interview<br>Do's & Don'ts for an interview | |
| | **Entrepreneurship skill** | **8** |
| **1.** | **Concept of Entrepreneurship**<br>**Entrepreneurship**- Entrepreneurship - Enterprises:-Conceptual issue.<br>Source of business ideas, Entrepreneurial opportunities, The process of setting up a business. | |
| **2.** | **Institutions Support**<br>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. | |
| | **Productivity** | |
| **1.** | **Productivity**<br>Definition, Necessity. | |
| **2.** | **Affecting Factors**<br>Skills, Working Aids, Automation, Environment, Motivation<br>How improves or slows down. | |
| **3.** | **Personal Finance Management**<br>Banking processes, Handling ATM, KYC registration, safe cash handling, Personal risk and Insurance. | |
| | **Occupational Safety, Health & Environment Education** | **6** |
| **1** | **Safety & Health**<br>Introduction to Occupational Safety and Health importance of safety and health at workplace. | |
| **2** | **Occupational Hazards**<br>Basic Hazards, Chemical Hazards, Vibro-acoustic Hazards, Mechanical Hazards, Electrical Hazards, Thermal Hazards. Occupational health, Occupational hygienic, Occupational Diseases/ Disorders & its prevention. | |
| **3** | **Accident & safety**<br>Basic principles for protective equipment.<br>Accident Prevention techniques - control of accidents andsafety measures. | |
| **4** | **First Aid**<br>Care of injured & Sick at the workplaces, First-Aid & Transportation of sick person | |
| | **Labour Welfare Legislation** | |
| 1 | **Welfare Acts**<br>Benefits guaranteed under various acts- Factories Act, Apprenticeship Act, Employees State Insurance Act (ESI) and Employees Provident Fund Act. | |
| | **Quality Tools** | **6** |
| **1.** | **Quality Consciousness :** | |

| | | |
|---|---|---|
| | Meaning of quality, Quality Characteristic | |
| **2.** | **Quality Circles :**<br>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. | |
| **3.** | **House Keeping :**<br>Purpose of Housekeeping, Practice of good Housekeeping. | |
| **4.** | **Quality Tools**<br>Basic quality tools with a few examples | |

## 7.2 PRACTICAL TRAINING (ON-JOB TRAINING)

## (BLOCK – I)

## DURATION: 12 MONTHS

## GENERAL INFORMATION

1) **Name of the Trade** :**Ceramic Moulder**

2) **Batch size** :a) Apprentice selection as per Apprenticeship guidelines.

b) Maximum 20 candidates in a group.

3) **Examination** : i) The internal assessment will be held on completion of the block

ii) NCVT exam will be conducted at the end of Apprenticeship Training

**4) Instructor Qualification** :

**i)** Degree/Diploma in Mechanical/Ceramic/MetallurgyEngg. from recognized university/Board with one/two year post qualification experience in the relevant field.

**OR**

**ii)** NTC/NAC in the trade of **Ceramic Moulder**with three year post qualificationexperience in the relevant field.

Preference will be given to a candidate with Craft Instructor Certificate (CIC)

4) **Infrastructure for On-Job Training** : - As per Annexure – II

## 7.2.1 BROAD SKILL COMPONENT TO BE COVERED DURING ON-JOB TRAINING

### A. BLOCK – I (09 months)

1. Safety and best practices/Basic Industrial Culture (5S, KAIZEN, etc.)
2. Prepare different types of documentation as per industrial need by different methods of recording information.
3. Making of various Models from Drawing.
4. Making of Models from samples.
5. Making of Models of Cups, Saucers, Tea pot, Milk Pot, Sugar pot, Bowl rice, pot, etc.
6. Making of Models of Sanitary Wares.
7. Process of preparation of Plaster from Gypsum.
8. Adjustment of Plaster Water Ratio.
9. Making of Models of Insulator.
10. Making of Models of Artistic Goods.
11. Making of Models of Historical Figurers.
12. Explanation on setting of Plaster
13. Testing of Strength of Plaster.
14. Perform TPM (Total Production Management), TQM (Total Quality Management) and record keeping system.

# 8. ASSESSMENT STANDARD

## 8.1 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 assessment. Due consideration to be given while assessing for team work, avoidance/reduction of scrape/wastage and disposal of scarp/wastage as per procedure, behavioral attitude and regularity in training.

The following marking pattern to be adopted while assessing:

**a)**Weightage in the range of 60-75% to be allotted during assessment under following performance level:

For this grade, the candidate with occasional guidance and showing due regard for safety procedures and practices, has produced work which demonstrates attainment of an acceptable standard of craftsmanship.

In this work there is evidence of:

- good skill levels in the use of hand tools, machine tools and workshop equipment
- many tolerances while undertaking different work are in line 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 above75%- 90% to be allotted during assessment under following performance level:

For this grade, the candidate, with little guidance and showing due regard for safety procedures and practices, has produced work which demonstrates attainment of a reasonable standard of craftsmanship.

In this work there is evidence of:

- good skill levels in the use of hand tools, machine tools and workshop equipment
- the majority of tolerances while undertaking different work are in line 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 above 90% to be allotted during assessment under following performance level:

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.

In this work there is evidence of:

- high skill levels in the use of hand tools, machine tools and workshop equipment
- tolerances while undertaking different work being substantially in line 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

## 8.2 FINAL ASSESSMENT- ALL INDIA TRADE TEST FOR APPRENTICE

| SUBJECTS | Marks | Sessional Marks | Full Marks | Pass Marks | Duration of Exam. |
|---|---|---|---|---|---|
| Practical | 300 | 100 | 400 | 240 | 08 hrs. |
| Trade Theory | 100 | 20 | 120 | 48 | 3 hrs. |
| Workshop Cal. & Sc. | 50 | 10 | 60 | 24 | 3 hrs. |
| Engineering Drawing | 50 | 20 | 70 | 28 | 4 hrs. |
| Employability Skill | 50 | - | 50 | 17 | 2 hrs. |
| **Grand Total** | **550** | **150** | **700** | **-** | |

Note: - The candidate pass in each subject conducted under all India trade test.

# 9. FURTHER LEARNING PATHWAYS

**Employment opportunities:**

On successful completion of this course, the candidates may be gain fully employed in the following industries:

- Ceramic & related ancillary industries

**ANNEXURE – I**

# TOOLS & EQUIPMENT FOR BASIC TRAINING

## INFRASTRUCTURE FOR PROFESSIONAL SKILL & PROFESSIONAL KNOWLEDGE

## TRADE:CERAMIC MOULDER

## LIST OF TOOLS & EQUIPMENTS FOR 20APPRENTICES

**A : TRAINEES TOOL KIT:-**

| Sl. No. | Description | Qty. |
|---|---|---|
| 1. | Safety goggles (armoured heat proof) | 1 |
| 2. | Protective apron (jute or Asbestos) | 1 |
| 3. | Rule Steel 300 M.M/12” | 1 |
| 4. | Tool Tray | 1 |
| 5. | Hand Brush 25 m.m. | 1 |
| 6. | Steel Rule 6”/150 m.m. | 1 |
| 7. | Foot Wear / Asbestos Over-shoes | 1 |
| 8. | Try Square 250 m.m/10” (for wood work) | 1 |
| 9. | Making Gauge (wood work) | 1 |
| 10. | Diagonal scale | 1 |
| 11. | Divider | 1 |
| 12. | Iron Moulds | 3 |
| 13. | Wooden Moulds | 3 |
| 14. | Wooden Hammer | 1 |
| 15. | Crucible (30 c.c. capacity) | 1 |
| 16. | Tongs (Nickel plated) | 1 |
| 17. | Specific Gravity bottle | 1 |

***B: Tools, Instruments and General Shop Out fits***

| Sl. No. | Description | Quantity |
|---|---|---|
| 18. | Standard Chemicals required for Acidimetry&Alhalimentry | 1 |
| 19. | Torsion Viscometer | 1 |
| 20. | Small Fitter Press | 1 |
| 21. | Small Vacuum Pugmill (moterised) | 1 |
| 22. | Modulus of rupture apparatus | 1 |

| | | |
|---|---|---|
| 23. | Platinum Crucible (30 capacity) | 2 |
| 24. | Nickel Crucible (30 capacity) | 8 |
| 25. | Electric Furnace 1000ºc capacity | 1 |
| 26. | Electric Furnace 1450ºc capacity | 1 |
| 27. | Gas fired Muffle Furnace 1200ºc capacity | 1 |
| 28. | Vacuum Pump | 1 |
| 29. | Vacuum Desecicator | 2 |
| 30. | Porcelain Mortar & Pestle | 6 |
| 31. | Iron Mortar & Pestle | 3 |
| 32. | Horse-sheet magnet | 4 |
| 33. | Stop-Watch | 2 |
| 34. | Chemical Balance | 2 |
| 35. | Student petrological Microscope | 1 |
| 36. | Tongs assorted | 4 |
| 37. | Asbestos Hand Gloves | 4 pairs |
| 38. | Pint Mug Enamek | 6 |
| 39. | Rule, contraction 600 m.m. | 1 |
| 40. | Drill, Ratchet Brace 10”/250 m.m. | 1 |
| 41. | Auger 6.9.12.15 m.m assorted | 1 each |
| 42. | Blow lamp, Kerosene | 2 |
| 43. | Shovel, hand | 2 |
| 44. | Wheel Barrows | 1 |
| 45. | Funnel Enamel 75 m.m. | 4 |
| 46. | Funnel Enamel 150 m.m. | 4 |
| 47. | Buretties, Pipette measuring cylinders, etc as required in a Chemical Laboratory. | As Required |
| 48. | Standard sieves (I.S.Std) | 1 Set |
| 49. | Chisel Cold Flat 12 m.m. | 4 Set |
| 50. | Chisel Cold Flat 20 m.m. | 4 |
| 51. | Hammer Ball pien 1 k.g. | 4 |
| 52. | Hammer Ball pien 2 k.g. | 4 |
| 53. | Half Round file 150 m.m. | 4 |
| 54. | Remmer flat | 4 |
| 55. | Wrench adjustable 75 m.m. | 2 |

| | | |
|---|---|---|
| 56. | Wire Brush | 4 |
| 57. | Screw Driver 250 m.m. | 3 |
| 58. | Screw Driver 150 m.m. | 4 |
| 59. | Engineering Try Square 150 m.m. | 2 |
| 60. | Scriber 200 m.m. | 4 |
| 61. | Pliers 200 | 4 |
| 62. | Caliper outside 150m.m. | 4 |
| 63. | Caliper inside 150m.m. | 4 |
| 64. | Face shields (Clear) | 8 |
| 65. | Head Wear | 8 |
| 66. | Fire extinguisher foan, chemical(according to factory regulation) | 2 |
| 67. | First-Aid Box including burn treatment | 2 |
| 68. | Fire Buckets with stand | 4 Sets |
| 69. | Work Bench 2m x 1.5m x 750 m.m. | 2 Nos. |
| 70. | Vice, Bench 125m.m.jaw | 4 |
| 71. | Locker Steel with 8 Drawers each | 2 |
| 72. | Hack Saw Frame adjustable 225mm to 300m.m | 4 |
| 73. | Hack Saw Blades 300 m.m. | As Required |
| 74. | Mallet Hide | 4 |
| 75. | Different tools & appliances for colouring | 8 Sets |
| 76. | Taper Trowel | 4 (different sets) |
| 77. | Temperature recorders | 4 Sets |
| 78. | Bunsen Burner | 8 |
| 79. | Refractory Fire Bricks | As Required |
| 80. | Oil/ Gas Burners | 4 sets each |
| 81. | Pyrometer / Thermocouples | 4 sets each |
| 82. | Indicators(Temperature) | 4 sets each |
| 83. | Steel Almirah for Teacher | 1 (for each trade) |
| 84. | Magnifying Lense | 4 |
| 85. | Physical Balance (250g.m.) | 3 |
| 86. | Travelling Microscope | 1 |

**C : General Machinery Shop outfit**

| Sl. No. | Name & Description of Machine | Quantity |
|---|---|---|
| 87. | Double ended Bench Grinder 150 mm Wheeldia | 1 |
| 88. | Drying Oven | 1 |
| 89. | Liquid limit Device | 3 |
| 90. | Jaw Crusher | 1 |
| 91. | Roller Mill | 1 |
| 92. | Edge Runner | 1 |
| 93. | Hammer Mill | 1 |
| 94. | Ball Mill | 1 |
| 95. | Pot Mill (3 to a set) | 3 sets |
| 96. | Weighing Scale 10 k.g. capacity | 1 |
| 97. | Weighing Scale 50 k.g. capacity | 1 |

# INFRASTRUCTURE FOR WORKSHOP CALCULATION & SCIENCE AND ENGINEERING DRAWING

## TRADE: CERAMIC MOULDER

## LIST OF TOOLS& EQUIPMENTS FOR 20APPRENTICES

1) **Space Norms** : 45 Sq.m.(For Engineering Drawing)

**2) Infrastructure:**

## A : TRAINEES TOOL KIT:-

| Sl. No. | Name of the items | Quantity (indicative) |
|---|---|---|
| 1. | Draughtsman drawing instrument box | 20 Nos. |
| 2. | Set square celluloid $45^0$ (250 X 1.5 mm) | 20 Nos. |
| 3. | Set square celluloid $30^0$-$60^0$ (250 X 1.5 mm) | 20 Nos. |
| 4. | Mini drafter | 20 Nos. |
| 5. | Drawing board (700mm x500 mm) IS: 1444 | 20 Nos. |

## B : FURNITURE REQUIRED

| Sl. No. | Name of the items | Quantity (indicative) |
|---|---|---|
| 1 | Drawing Board | 20 Nos. |
| 2 | Models : Solid & cut section | as required |
| 3 | Drawing Table for trainees | as required |
| 4 | Stool for trainees | as required |
| 5 | Cupboard (big) | 01 |
| 6 | White Board (size: 8ft. x 4ft.) | 01 |
| 7 | Trainer's Table | 01 |
| 8 | Trainer's Chair | 01 |

**ANNEXURE – II**

## INFRASTRUCTURE FOR ON-JOB TRAINING

## TRADE: CERAMIC MOULDER

## For Batch of 20APPRENTICES

Actual training will depend on the existing facilities available in the establishments. However, the industry should ensure that the broad skills defined against On-Job Training part (i.e. 12 months) are imparted. In case of any short fall the concern industry may impart the training in cluster mode/ any other industry/ at ITI.

**ANNEXURE-III**

## GUIDELINES FOR INSTRUCTORS AND PAPER SETTERS

1.Due care to be taken for proper & inclusive delivery among the batch. Some of the following some method of delivery may be adopted:

A) LECTURE
B) LESSON
C) DEMONSTRATION
D) PRACTICE
E) GROUP DISCUSSION
F) DISCUSSION WITH PEER GROUP
G) PROJECT WORK
H) INDUSTRIAL VISIT

2. Maximum utilization of latest form of training viz., audio visual aids, integration of IT, etc. may be adopted.

3. The total hours to be devoted against each topic may be decided with due diligence to safety & with prioritizing transfer of required skills.