

## 390 – CERAMICS

### GOAL:

This trade component is designed to expose the students to the basic designs, texture and ceramic materials, which will enable the students acquire the skills to carry out the basic Ceramic production processes.

This trade is made up of ONE component called Ceramics and Designs.

### 391 – **CERAMICS AND DESIGNS: Consist of:**

- (a) Introduction to Ceramics – CCE 12
- (b) Basic Ceramic Materials – CCE 11
- (c) Throwing and Casting Techniques – CCE 13
- (d) Basic Decoration Techniques – CCE 14
- (e) Material Estimation in Ceramic Production – CCE 15
- (f) Basic Drawing and Techniques – CGD 11
- (g) Basic Shapes and Forms – CGD 12
- (h) Element of Design – CGD 14
- (i) Texture and tones – CGD 15
- (j) Introduction to Life Drawing – CGD 16

**NOTE:** The Trade Related Subjects are:

- 193 – Building/Engineering Drawing
- 194 – Basic Electricity

391 – **CERAMICS AND DESIGNS:** For this trade component, there will be two papers.

391-1 **Paper 1** - This shall consist of 40 objective questions to be answered in 40 minutes for 40 marks and 5 essay questions, out of which candidates are expected to answer 4 questions in 1 hour 40 minutes for 60 marks.

391-2 **Paper II Practical** – This shall consist of ONE Compulsory question and shall last for 4 hours and it carries 100 marks.

### 391 - CERAMICS AND DESIGN

S/No	Topic/Objective	Contents	Activities/Remark
1.	<b>Basic Ceramic Materials</b>	1. Formation of igneous rock and granite Clay bodies and their terminologies in Ceramics. Other types of rocks i.e. Sedimentary, metamorphic.	1. Identifying the plastic materials used in the production of ceramic wares. 1. Use appropriate techniques in mining, porunding and screening of clay.
1.1	Origin of clay type. Explain the type of clay used in ceramics.	2. The evolution of clay, plastic clay, dry powder and clay slip i.e. primary & Secondary clays. 3. Chemical composition of clay 4. The functions, properties and characteristics of clay and non plastic materials. 5. Non-plastic materials, (silical, field-spar, alkaline) in ceramic. 6. Preparation of clay bodies from clay and related materials	
1.2	<b>Traditional Pottery</b> Explain the observational and tactile awareness of form through manipulating clay types.	1. The chronological evolution of traditional pottery 2. Procedures of mixing clay in traditional pottery. 3. Techniques of wedging and storage of clay in traditional pottery. 4. Techniques of local pottery with emphasis on shapes, design and uses.	1. List the various ways in which prepared clay be used for traditional pottery i.e. pincing. 2. Describe the major development and castings in traditional pottery e.g. use of old base as mould.
1.3	<b>Local Glaze Materials</b> Explain rocks, leaves and wood as glaze materials.	1. Types of rocks, leaves and wood for local glazes e.g. feldspar quarts.	1. List the examples of feldspar, flint, limestone, sand, leaves, wood ashes, Cornish stone etc.

1.4	<p><b>Plaster of Paris</b> Explain Plaster of Paris (P.O.P)</p>	<ol style="list-style-type: none"> <li>2. The nature of such rocks, leaves, cornish stone etc and woods as mentioned above.</li> <li>3. The technique of utilizing these materials e.g. calcinations, size reduction sieving/lawning.</li> </ol>	<ol style="list-style-type: none"> <li>1. Explain the application of defloculants.</li> </ol>
1.5	<p><b>Defloculants</b> Explain defloculants</p>	<ol style="list-style-type: none"> <li>1. Basic raw material for production of production of P.O.P e.g. gypsun.</li> <li>2. Method of producing P.O.P e.g. calcing, chrushing.</li> <li>3. The behaviour of P.O.P in ceramic production.</li> </ol> <ol style="list-style-type: none"> <li>1. Different types of defloculants</li> <li>2. The chemical nature of deflocutants.</li> <li>3. The effect of excessive use of defloculants on slip and moulds.</li> </ol>	
2.	<p><b>Introduction to Ceramics</b></p>	<ol style="list-style-type: none"> <li>1. Definition of Ceramics and its relation to other Art disciplines.</li> </ol>	<ol style="list-style-type: none"> <li>1. Identify simple hand tools in use for making Ceramic products (production of simple tools from local materials such as woods, plastic and tibs).</li> </ol>
2.1	<p>Basic hand tools: Explain the uses of basic hand tools for making ceramic wares.</p>	<ol style="list-style-type: none"> <li>2. The use of hand tools for making Ceramic e.g. woods, plastics, ribs, etc for production of flower vase.</li> <li>3. Differences between kaolin and ball clay. (Primary and Secondary Clays).</li> </ol>	<ol style="list-style-type: none"> <li>2. Differentiate between properties of primary and secondary clays, in terms of plasticity, porosity and shrinkage.</li> </ol>
2.2	<p><b>Basic Properties of Clays and Types of Ceramic Products.</b> Explain the basic properties of clays</p>	<ol style="list-style-type: none"> <li>4. Characteristics of stone-ware clay and Earthenware clay and porcelain bodies</li> <li>5. Explanation of Bentonite.</li> </ol>	<ol style="list-style-type: none"> <li>1. Identify and explain the type of clay used for the production of</li> </ol>

2.3	<p>and types of Ceramic products.</p> <p><b>Brick Types and Refractories</b> Explain bricks types: Insulated and refractories.</p>	<p>6. Clay types with regards to porosity, plasticity and shrinkage.</p> <p>7. Types of Ceramic products: Art Ware, Earthen ware, Porcelain ware, Bone China, tiles and sanitary wares.</p> <p>1. Basic methods of brick-making.</p> <p>2. Moulds types for the production of ceramic bricks.</p> <p>3. Basic drying method of ceramic bricks.</p> <p>4. Firing methods and temperature control of various bricks.</p> <p>5. Various types of bodies for bricks.</p>	<p>any three items: Art ware, earthen ware, Porcelain ware, Bone, China, Tiles and Sanitary wares.</p> <p>1. Describe simple bricks for construction of a small fire wood kiln.</p>
3.1	<p><b>3. Throwing and Casting Techniques</b> Basic throwing techniques.</p>	<p>1. Various throwing stages in ceramics.</p> <p>2. The causes of poor throwing i.e. air bubbles, stones and poor centring.</p> <p>3. Stages for throwing simple Ceramic wares i.e. cylinders, lids, cones, bowls, bottles.</p> <p>4. Explaining the need for grog mixing clay bodies.</p> <p>5. The basic need for trimming thrown forms i.e. bowls, jugs and bottles.</p> <p>6. The methods of preparing and fixing of handles on thrown forms.</p> <p>7. Drying of thrown Ceramic wares.</p>	<p>1. Use of throwing as appropriate technique for shaping different objects i.e. bowls, cups, saucers, plates, bottles, vases, mugs, etc.</p>
3.2		<p>1. The various casting techniques for producing Ceramic wares</p>	<p>1. Describing the method of producing simple cast models</p> <p>2. Explaining how to produce moulds from</p>

	<p><b>Casting Techniques</b> Demonstrate a basic casting technique</p>	<ol style="list-style-type: none"> <li>2. The procedures involved in casting of ceramic form.</li> <li>3. Demonstrate how to pour slip and remove cast wares.</li> <li>4. The functions of sculptural Ceramic i.e. figurine heads, base relief.</li> <li>5. The type of clay suitable for casting slip.</li> <li>6. Methods of dressing the green casted ware.</li> <li>7. Drying and firing of cast wares.</li> <li>8. Appropriate techniques for glazing of casted ceramic works.</li> </ol>	<ol style="list-style-type: none"> <li>3. Identifying of Ceramic cast forms.</li> <li>4. Prepare simple moulds for casting.</li> <li>5. Use different casts method for producing various Ceramic forms from prepared moulds.</li> </ol>
<p><b>4.0</b></p> <p><b>4.1</b></p>	<p><b>Basic Decoration Techniques</b> Explain the basic decoration techniques.</p>	<ol style="list-style-type: none"> <li>1. Explain the need for applying decoration of the various techniques use in wares decorating Ceramic wares.</li> <li>2. The hand tools used in Ceramic decoration</li> <li>3. The industrial tools used for decorating, ceramic wares.</li> <li>4. The materials used for decoration.</li> <li>5. The functions of each of the industrial tools and hand tools used in Ceramic decoration.</li> <li>6. Differences between African motif and western figures.</li> <li>7. Description of appropriate natural forms to explore surface beauty textures of chosen Ceramic wares.</li> <li>8. Difference between patterns used for household ceramics</li> </ol>	<ol style="list-style-type: none"> <li>1. The Use of drawing from natural forms to explore aesthetic patterns on ceramic forms.</li> <li>2. Identify transfer design from direct design.</li> <li>3. Make free hand sketches and drawing of motifs of chosen objects to be reflected on finished clay works.</li> </ol> <ol style="list-style-type: none"> <li>1. Identify design patterns for reproduction on tiles for a fountain or swimming pool.</li> <li>2. Describe design patterns using floral form or geometric shapes for reproduction of floor tiles.</li> </ol>

<p>4.2</p>	<p>Explain how to develop creative facility together with functional reality.</p> <p><b>Glaze Decoration</b> Explain the technique of glaze application.</p>	<p>wares from those used for decoration.</p> <p>9. Design methods for ceramic name plate.</p> <p>10. Simple designs for plaques and trays for mass production.</p> <p>11. The process of painting and enamel transfer in ceramics.</p> <p>12. The methods of engraving, graffito and transfer patterns on ceramic forms.</p> <p>13. Design techniques on raw pot, e.g.</p> <ul style="list-style-type: none"> <li>- impressed design</li> <li>- embossed design</li> <li>- pierced design</li> <li>- incised, fluted and faceted design</li> <li>- inlaying design</li> <li>- slip decoration/slip painting and sgraffito design</li> <li>- painting with stains and colour pigment design.</li> </ul> <p>14. The technique of decoration on biscuit ware e.g.</p> <ul style="list-style-type: none"> <li>- under glaze</li> <li>- over glaze</li> <li>- waxing</li> <li>- screen printing</li> <li>- lustre.</li> <li>- inglaze</li> </ul> <p>1. The basic raw materials for glazes.</p> <p>2. Mixing of glaze</p> <p>3. Methods of glaze application.</p> <p>4. Glaze defects.</p> <p>5. Ceramic oxides and their</p>	<p>3. Explain the techniques of drawing to produce patterns for use on flower vases, jugs and industrial tiles.</p> <p>1. Identify glaze defects and properly glazed ware.</p> <p>2. Identify the sources of basic raw materials for glaze.</p>
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		reactions on glaze ware.	
5.	<b>Materials Used In Ceramic Production</b>		
5.1	<b>Materials and properties in Ceramics.</b> Explain the basic materials and their properties in Ceramics.	1. The various materials used in ceramics i.e. glazes. Oxides etc. 2. Processing of basic Ceramic materials e.g. crushing, ball milling etc. 3. Definition of specification as it relates to printing materials e.g. paper, ink, boards, etc. 4. Various trade terms e.g. basic weight, grammage, film speed, tensile screen, paper sizes, etc.	1. Stating the properties of various ceramic materials. 2. Assess profitability by comparing estimated cost and actual cost of the job.
5.2	<b>Material specification.</b> Explain material specification.	5. The type of material required for a Ceramic job.	3. Use the following documents in the effective control of stock: - stock ledger - material requisition card, etc.
5.3	<b>Material Quantities</b> Explain how to calculate material quantities and cost for a job.	6. Estimation of the quantity of material required for a job. 7. Estimation of production time required for a given job, taking into consideration the production process.	
5.4	Stock Control.	8. The concepts of minimum level, maximum lead time and safety stock in stock regulation.	

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6.0	<b>Basic Drawing Techniques</b>	1. The uses and functions of graphite pencils. 2. The varieties of chalks and oil pastel used in drawing. 3. Types of basic papers used in drawing. 4. The effects of crayons on paper type. 5. The effects of inks and pens on textured drawing papers with the use of brushes.	5. Produce a sketch using graphite pencil. 6. Make sketches, using crayons on different type of drawing papers. 7. Make sketches based on inks and pen on different textured drawing papers.
6.1	<b>Basic Drawing Tools</b> Explain the basic drawing tools.		
1.2	<b>Fundamental Drawing Techniques</b> Explain the fundamental drawing techniques.	1. Application of texture approach to show perspective of objects and shapes. 2. The use of lines for composition drawing i.e. quick sketching, gesture drawing, caricature, etc. 3. The function of rhythm in line drawing. 4. The use of picture planes as basics of two dimensional drawing.	1. Use line drawing to indicate rhythm. 2. Show perspective of objects and shapes using texture approach. 3. Make compositional drawings. 4. Make a two dimensional drawing.
7.0	<b>Basic Shapes and Forms.</b> Explain and draw Basic Shapes and Forms.	1. Basic geometric shapes of circles, triangle, square, etc. 2. Draw arranged objects of different sizes, shapes and textures.	1. Use selected media to draw basic geometric shapes. 1. Produce drawing based on the principles of perspective.
7.1	<b>Perspective Drawing</b> Explain and identify perspective drawing.	1. The principles of perspective e.g. eye view, vanishing point, height, etc. 2. The techniques of copying and tracing in drawing, for enlargement or reduction of any drawing.	2. Make use of perspective principles to reproduce and illustrate. 1. Use pencil or crayon to produce studies of human head, showing details of the eye, ear,
7.2	<b>Human Anatomy</b>		



	<p><b>In Life Drawing</b> The basic of human anatomy studies. Explain the basic study of human anatomy.</p>	<ol style="list-style-type: none"> <li>1. The various parts of human anatomy and their properties.</li> <li>2. Drawing of human torso.</li> </ol>	<p>nose and mouth.</p> <ol style="list-style-type: none"> <li>2. Produce sketches of the hand showing the various positions of the fingers, wrist, arm twist, etc.</li> <li>3. Use pen to show studies of the feet in different positions and postures.</li> <li>4. Draw human model standing.</li> </ol>
7.3	<p><b>Animal Anatomy</b> Explain the Animal Anatomy.</p>	<ol style="list-style-type: none"> <li>1. Simple methods of selecting any media to produce sketches of studies of animal head.</li> <li>2. Proportioning techniques to show movements of the animal body in motion.</li> <li>3. Application of water colour or gouache technique to produce finished drawing of cat, dog, goat in action.</li> </ol>	<ol style="list-style-type: none"> <li>1. Produce detail of eyes, ear, nose and mouth of the animal head.</li> <li>2. Show details of the leg movement and claws from sketches of the animal body motion, using proportioning techniques.</li> <li>3. Make sketches of cat, dog and goat in action.</li> </ol>

<p><b>8.0</b></p>	<p><b>Elements of Design</b> Explain the elements of design.</p>	<ol style="list-style-type: none"> <li>1. Different instruments used in design e.g. drawing set, T square, French curves, etc.</li> <li>2. Elements of design i.e. line, shape, colour, texture etc.</li> <li>3. Principles of design i.e. harmony, contrast, balance, unity etc.</li> <li>4. Tonal effect</li> <li>5. Definition of colour and spectrum.</li> <li>6. Importance of colour in design concept.</li> <li>7. The different classification of colours i.e. cool, warms, complimentary etc.</li> </ol>	<ol style="list-style-type: none"> <li>1. Use line, shape colour texture etc. to produce design.</li> <li>2. Use various elements of design to produce a two or three dimensional drawings of ceramic ware.</li> <li>3. Construct a colour wheel chart, using primary and secondary colours.</li> <li>4. Use colours to produce a design of tea sets or other ceramic wares.</li> </ol>
<p><b>9.0</b></p> <p>9.1</p>	<p><b>Basic Body Proportion</b> Describe and explain body proportion</p> <p><b>Three Dimensional Form</b> Explain how to apply the knowledge of life drawing in sculptural ceramics.</p>	<ol style="list-style-type: none"> <li>1. Explain action of how to produce a working sketch with the basic body proportion.</li> <li>2. Measurement of body proportion from a seated model.</li> <li>3. Different parts of the human body with emphasis on proportion.</li> </ol> <ol style="list-style-type: none"> <li>1. Explain action of three dimensional form.</li> <li>2. Explain geometric shapes of the parts of the human body with pencil.</li> <li>3. three dimensional techniques of producing a fountain based on sculptural ceramic techniques.</li> </ol>	<ol style="list-style-type: none"> <li>4. Use crayon to produce movement of the arms and waist of human body.</li> <li>5. Produce sketches of a seating, or kneeling figure from posed models.</li> </ol> <ol style="list-style-type: none"> <li>1. Produce sketches of on the round figure of human body.</li> <li>2. Produce charcoal drawings of bird movement emphasizing geometric shape.</li> <li>3. Select any animal in your locality to produce sketches for sculptural ceramic production.</li> </ol> <ol style="list-style-type: none"> <li>1. Produce sketches for sculptural ceramics to be used at a sports stadium.</li> </ol>

9.2	<p><b>Sculptural Ceramics</b> Explain the aspect of sculptural Ceramics</p>		<ol style="list-style-type: none"> <li>2. Making sketch designs for flower vase or building column using sculptural ceramic approach.</li> <li>3. Produce sketches for moral panel of an orphanage at your state capital.</li> </ol>
<p><b>10.0</b> 10.1</p>	<p><b>Texture and Tones</b> Texture in Design. Explain the importance of texture in design.</p>	<ol style="list-style-type: none"> <li>1. The colour design (three colours) of shapes for ceramic reproduction and display.</li> <li>2. The monochrome design of any shape.</li> <li>3. Tones in design.</li> <li>4. Different colours of design for production of ceramic wall tiles for a living room.</li> </ol>	<ol style="list-style-type: none"> <li>1. Use various textures in design for ceramic production.</li> <li>2. Use pencil, pen, colour to produce design of objects in different textures.</li> <li>3. Select two primary colours to design a three dimensional object, i.e. flower vase.</li> </ol>