BANGLADESH TECHNICAL EDUCATION BOARD

Agargaon, Dhaka-1207.

4-YEAR DIPLOMA-IN-ENGINEERING PROGRAM SYLLABUS (PROBIDHAN-2016)

CERAMIC TECHNOLOGY

TECHNOLOGY CODE: 676

FIRST SEMESTER

ENGINEERING

PROBIDHAN-2016

Ceramic Technology 1st Semester

Sl. No	Subject Code	Name of the subject	T	P	C	Marks				
						Theory		Practical		Total
						Cont. asses s	Final exam	Cont. asses s	Final exam	
1	61011	Engineering Drawing	0	6	2	0	0	50	50	100
2	65811	Social Science	3	0	3	60	90	0	0	150
3	65812	Physical Education and life skill development	0	3	1	0	0	25	25	50
4	65911	Mathematics -1	3	3	4	60	90	50	0	200
5	65913	Chemistry	3	3	4	60	90	25	25	200
6	66711	Basic Electricity	3	3	4	60	90	25	25	200
7	67611	Ceramic Engineering Materials-1	2	3	3	40	60	25	25	150
Total			14	21	21	280	420	200	150	1050

67611 **CERAMIC ENGINEERING MATERIALS-1** **T P C**

2 3 3

AIMS

To provide the student with an opportunity to develop knowledge and skill to-

- Understand the concept of ceramic engineering materials.
- Understand the basic concept of ceramic
- Understand the clay materials.
- Understand the plasticity.
- Understand the deflocculant.
- Understand the ions.
- Understand the adsorption of clay.
- Understand the effect of heat on clay.
- Understand the winning and purification of Clay.
- Analysis and use the different types of clays,

SHORT DESCRIPTION

Introduction to ceramics and ceramic raw materials; Kaolinite; China clay; Ball clay; Local clay; Fire clay; Bentonite; plasticity; deflocculant, ions, adsorption of clay, effect of heat on clay, winning and purification of Clay and Analysis

DETAILED DESCRIPTION

Theory:

1. Understand the Introduction of Ceramic.

1.1 Define Ceramic.
1.2 Describe the history of Ceramic.
1.3 Describe the Modern Stage of Ceramic.
1.4 Mention the uses of ceramic in daily life.
1.5 List the uses of ceramic in electric field.
1.6 Explain the purpose of ceramic in lavatories.
1.7 Name the ceramic used as non-structural products.

2. Understand the Ceramic Raw material.

2.1 Define ceramic raw material.
2.2 Classify ceramic raw material.
2.3 List the plastic and non-plastic ceramic raw materials.
2.4 Distinguish between plastic and non-plastic ceramic raw materials
2.5 Describe the filler materials.
2.6 Explain the fluxing materials
2.7 List the fluxing materials used in ceramic field.
2.8 Discuss the function of fluxing materials.

3. Understand Clay.

3.1 Define clay.
3.2 Classify clay.
3.2 Mention the chemical formula of clay.
3.3 Describe the formation of clay.
3.4 Discuss the properties of clay.
3.5 Compare between the primary clay and the secondary clay.
3.6 Explain the reason of secondary clay containing impurities.
3.7 List the uses of clay.

4. Understand the Residual/ primary Clay.

4.1 Define residual clay.
2 List the residual clay
4.3 Describe the properties of residual clay.
4.4 Mention the impurities of residual clay.
4.5 Explain the uses of residual clay.

Understand the Secondary Clay.

4.1 Define secondary Clay.
4.2 List the Impurities of secondary clay.
4.3 Mention the Function Foreign materials.
4.4 Describe the properties of secondary clay.
4.5 Distinguish between the residual and secondary clay.
4.6 Explain the uses of field in secondary clay.

Understand the wining of ceramic Raw materials.

4.7 Define winning.
4.8 Describe the basic concept of wing process.
4.9 List the winning process.
4.10 Describe the winning process.
4.11 Explain the importance of ceramic raw materials winning process.
4.12 List the machinery used in clay winning.

Understand the purification of ceramic Raw materials.

4.13 Define purification of clay.
4.14 List the purification process of clay.
4.15 Describe the basic concept of purification of clay.
4.16 Mention the advantage of purification of clay.
4.17 Discuss the storaging process of clay materials.

Understand the clay minerals.

4.18 Discuss about the clay minerals.
4.19 List the clay minerals.
4.20 Define kainite and kaolinite.
4.21 Describe the formation of clay.
4.22 Explain the Montmorillonite.
4.23 Describe the mica.

Understand the kaolin.

4.24 Discuss the basic concept of kaolin.
4.25 Write the chemical formula

Mention the chemical analysis of
Describe the properties of kaolin.

4.26 Mention the sources of kaolin.

4.27 List the uses of kaolin.

Understand ball clay.

4.28 Define ball clay.

4.29 Mention the sources of ball clay.

4.30 Write the chemical analysis of ball clay.

4.31 Describe the properties of ball clay.

4.32 List the uses of ball clay.

4.33 Explain ball clay is a secondary clay.

Understand local Clay

4.34 Brief basic concept of local clay.

4.35 Mention the Source of Local Clay in Bangladesh.

4.36 Describe the physical properties of Local Clay.

4.37 Explain the uses of Local Clay.

4.38 Describe the Purification Process in Local Clay.

5. Understand the Bijoypur Clay

12.1. Discuss the Bijoypur Clay.

12.2. Describe the Physical Properties of Bijoypur clay.

12.3 Mention the Chemical analysis of Bijoypur clay.

12.4 Explain the uses of Bijoypur Clay in Ceramic Sector.

12.5. Describe Advantage of Bijoypur Clay.

12.6 List the impurities of Bijoypur Clay.

Understand the Sherpur Clay.

13.1. Describe the basic Concept of Sherpur Clay.

13.2. Describe the Physical Properties of Sherpur Clay.

13.3. Mention the Chemical analysis of Sherpur Clay.

13.4. Explain the uses of Sherpur Clay in Ceramic sector.

13.5. Distinguish between the Bijoypur Clay and Sherpur Clay.

Understand the Sylhet Clay.

14.1. Define Sylhet Clay.

14.2. Explain the Chemical Analysis Sylhet Clay.

14.3. Describe the Physical Properties of Sylhet Clay.

14.4. Describe the uses of Sylhet Clay.

14.5 Mention the impurities of Sylhet clay.

Understand the Bentonite.

15.1. Define Bentonite.

15.2. Mention the Source of Bentonite in the World.

15.3. Describe the Physical Properties of Bentonate.

15.4. Explain the uses of bentonite.

15.5. Mention the Chemical Analysis of bentonite.

Understand the Fire Clay.

5.1 Define Fire Clay.
5.2 Classify fire clay.
16.3. Mention the Sources of Fire clay.
16.4. Describe the properties of Fire clay.
16.5. Explain the uses of fire Clay.
16.6. Explain the analysis of fire clay.

Understand the Brick Clay.

17.1. Describe Basic concept of Brick clay define Shale.
17.2. Describe the Physical properties of brick Clay.
17.3. List the impurities of brick Clay.
17.4. Mention some brick clay Chemical analysis.
17.5. Explain the uses of brick clay.
17.6. List the Impurities of Brick clay.
17.7. Describe the impurities brick clay.

Understand the Plasticity.

18.1. Define Plasticity.
18.2. Classifiy Plasticity.
18.3 Describe the different types of plasticity.
18.4. List the Theory of Plasticity.
18.5. Describe the theory of Plasticity.
18.6. Explain the needs of Plasticity in Ceramic body preparation.

Practical:

1. **Show skill in studying the china clay.**
   - 1.1 Demonstrate skill in physical identification of china clay.
   - 1.2 Practice skill in determining the loss on ignition of china clay.
   - 1.3 Demonstrate skill in determining the water of plasticity of china clay.
   - 1.4 Practice skill in determining the dry shrinkage of china clay.
2. **Show skill in studying the ball clay.**
   - 2.1 Demonstrate skill in identifying the ball clay
   - 2.2 Practice skill in determining the loss on ignition on ball clay.
   - 2.3 Demonstrate skill in determining the water of plasticity of ball clay.
   - 2.4 Practice skill in determining the dry shrinkages of ball clay.
3. **Show skill in studying Local clay.**
   - 3.1 Demonstrate skill in physical identifying the Bijoypur clay.
   - 3.2 Practice skill in determining the loss on ignition of Bijoypur clay.
   - 3.3 Demonstrate skill in determining the water of plasticity of Bijoypur clay.
   - 3.4 Practice skill in determining the dry shrinkages of Bijoypur clay.
4. **Show skill in studying fire clay.**
   - 4.1 Demonstrate skill in physical identifying the fire clay.
   - 4.2 Demonstrate skill in determining the loss on ignition of fire clay.
5. **Show skill in studying Bentonite.**
   - 5.1 Demonstrate skill in physical identifying the bentonite clay.
   - 5.2 Practice skill in determining the loss on ignition of bentonite.
   - 5.3 Demonstrate skill in determining the water of plasticity of bentonite.
   - 5.4 Practice skill in determining the dry shrinkages of bentonite.

6. Show skill in studying kaolinite.

6.1 Demonstrate skill in physical identification of kaolinite.
6.2 Demonstrate skill in determining the loss on ignition of kaolinite...
6.3 Demonstrate skill in determining the water of plasticity of kaolinite.
6.4 Demonstrate skill in determining the dry shrinkages of kaolinite.

REFERENCE BOOKS

1. Clay and ceramic Raw Materials By . Worral W.E.
2. Advanced Ceramic Materials By. Hamid Moshaghaei.
3. Industrial ceramic. By Sonja.S. Singer and Felix.
4. An Introduction the Technology of Pottery. By Paul Rado
5. Mullite and Mullite Ceramics.- By Hchnider,Okada & Pask
6. Properties of Ceramic Raw Materials by W. Ryan.
7. Ceramic engineering materials- By Belayet Hossain