

# Daffodil Polytechnic Institute, Institute Code: 50238

Lesson Plan – Academic session: January 2024 to June 2024

Subject Teacher: Md. Emon Khan,

Jr.Instructor, Civil Technology.

Subject Name: Civil Engineering Materials.

Subject Code: 26411

Technology: Civil

Semester: 1st.

BTEB Text Book Name: Civil Engineering Materials (Any Publisher)

Reference Book Name: Engineering Materials (Dr. M.A. AZIZ)

<i>Marks</i>	<b>Grade Point</b>	<b>Letter Grade</b>	<i>Marks</i>	<b>Grade Point</b>	<b>Letter Grade</b>
80>	4.00	A+	55-59	2.75	B
75-79	3.75	A	50-54	2.50	C+
70-74	3.50	A-	45-49	2.25	C
65-69	3.25	B+	40-44	2.00	D
60-64	3.00	B	0-39	0.00	F

<b>Class Timing Distribution</b>	
<b>Particulars</b>	<b>Time</b>
Greeting with students	05 Minutes
Previous Class Review	10 Minutes
Present Class Topic Discussion and Lecture Delivery	60 Minutes
Present Class Topics Review	15 Minutes
Total	90 Minutes

<b>Mark Distribution (for 150 Marks)</b>			
<b>Theory Marks</b>		<b>Practical Marks</b>	
Midterm	20	PC	25
Class test	10	PF	25
Quiz test	10	-	-
Final	60	-	-
<b>Total</b>	<b>100</b>	<b>Total</b>	<b>50</b>

## **Rational:**

Civil Engineering diploma holders have to supervise construction of various types of civil works involving use of various materials like stones, bricks, sand, cement, lime, tiles, timber and wood based products, paints and varnishes, metals and other miscellaneous materials. The students should have requisite knowledge regarding characteristics, uses and availability of various building material and skills introducing tests to determine suitability at materials for various construction purposes. In addition, specifications of various materials should also be known (PWD/BNBC) for effective quality control.

**Learning Outcome (Theoretical):**

After undergoing the subject, students will be able to

- State different construction materials and their properties.
- Interpret different type of stones.
- Mention different types of bricks and Blocks.
- Describe field and laboratory tests of stone, bricks, sand, and cement.
- Illustrate different types of timber.
- Discuss different type of defects of timber.
- Explain paints/varnishes for various types of surfaces.
- State and explain different types of Modern building materials such as ceramic, glass, metals and plastic, Tiles, Geo-Textile, Paint Insulating materials and chemicals.

**Learning Outcome (Practical):**

After undergoing the subject, students will be able to

1. Identify the various types of stone.
2. Demonstrate laboratory test of stone.
3. Perform field test and laboratory test of Bricks.
4. Practice field test and laboratory test of Cement.
5. Observe field test and laboratory test of Sand.
6. Perform laboratory tests of mild steel.
7. Identify the various types of wood and artificial wood.

Theory Lesson Plan			
Unit	Topics with Contents	Class No	Final Marks
1	CIVIL ENGINEERING MATERIALS 1.1 Define civil engineering materials. 1.2 Classify civil engineering materials. 1.3 List the names of different engineering Materials.	1	2
2	STONE 2.1 Define stones. 2.2 Classify stones. 2.3 List the characteristics of good stones for construction. 2.4 Describe the dressing of stones. 2.5 Explain the field test and Laboratory test of Stone. 2.6 Mention the uses of stone in the civil engineering field.	2 &3	9
QT & CT 1, Assignment-1			

3	<b>BRICK &amp; HOLLOW BLOCK</b> 3.1 Define bricks. 3.2 Mention the raw materials of Bricks and properties of good bricks making earth. 3.3 Explain the manufacturing of bricks. 3.4 Discuss the Size of Brick as per BNBC & PWD specification. 3.5 Illustrate the field test of bricks. 3.6 Interpret Bricks Compressive strength, Water absorption, Efflorescence, Dimensional tolerance Test (as per BNBC). 3.7 List the characteristics of Hollow Block, Solid block & ceramic brick. 3.8 Mention the uses, Advantage and disadvantage of hollow block Solid block and ceramic brick. 3.9 Explain the procedure of manufacturing of Hollow Block, Solid block & ceramic brick.	4,5,6&7	9
4	<b>SAND</b> 4.1 Classify sand according to their sources. 4.2 Describe the field test and Laboratory Test of sand. 4.3 Mention the use of various grades of sand.	8&9	5
<b>QT &amp; CT 2, Assignment-2</b>			
<b>Mid-Term Exam</b>			
5	<b>CEMENT AND LIME</b> 1.1 Define cement and lime. 1.2 Mention the Raw materials of cement & functions of various ingredients of cement. 1.3 Draw the Flow diagram of the manufacturing process of cement. 1.4 Mention the properties and uses of ordinary Portland cement and Portland composite Cement. 1.5 Explain the testing of cement as per BNBC: Strength of Cement, Fineness by sieving, Consistency, Soundness, Setting times. 1.6 State special cement. 1.7 List the uses of special cement. 1.8 Explain the storage process of cement. 1.9 List the uses of Lime.	10&11	9
6	<b>TILES</b> 6.1 Define clay, concrete, Plastic, Mosaic, Marble, Glazed, Homogenous and Vitrified tile. 6.2 Explain the uses of different kinds of tiles. 6.3 Explain the field test of tiles.	12	3

7	<b>TIMBER &amp; WOOD BASED PRODUCTS</b> 7.1 Classify Exogenous and Endogenous trees and cross section. 7.2 Explain Teak, Shikari, Mohegan, Gamari, Teak Chambal, Mango timber. 7.3 Mention the market forms of converted timber as per PWD. 7.4 State seasoning and method of seasoning of Timber. 7.5 Define wood-based products. 7.6 Describe the manufacturing process and uses of plywood. 7.7 Explain the Veneers. 7.8 Mention the use of laminated board, block board, fiber board, MDF and HDF board, melamine board and gypsum board.	13&14	5
8	<b>GLASS</b> 8.1 Mention the constituents of glass. 8.2 Define Plate, weird, Tempered, colored, fiber, formed and float glass. 8.3 Point out the uses of Plate, weird, Tempered, colored, fiber, formed and floating glass. 8.4 Describe the properties and uses of glass.	15&16	3
9	<b>PAINTS AND VARNISHES</b> 9.1 Mention the purpose and uses of paints. 9.2 Explain Distemper, plastic paint, enamels paint, cement paint, weather coat paint, and easy clean paint for outside of the building. 9.3 State the uses of Distemper, plastic paint, enamels paint, cement paint, weather coat paint, and easy clean paint for outside of the building. 9.4 Describe the properties and uses of varnish and polish. 9.5 Explain the properties and the uses of lacquers.	17	2
10	<b>METALS AND PLASTIC</b> 10.1 List the common types of iron used in Construction. 10.2 Mention the uses of wrought iron and cast iron. 10.3 Classify steel on the basis of carbon content. 10.4 State the uses of the Mild, alloy and stainless steel. 10.5 Describe light metal (aluminum/white metal) as construction material. 10.6 Mention the uses of aluminum as construction materials. 10.7 Compare between plastic and laminating plastic. 10.8 Mention the characteristics of thermoplastic and thermosetting plastic. 10.9 Illustrate the uses of plastic and laminating plastic.	18&19	5
11	<b>INSULATING MATERIALS AND GEO-TEXTILES</b> 11.1 Define insulating materials. 11.2 Make a list of insulating materials. 11.3 Explain sound and thermal insulation. 11.4 Mention the uses of insulating Material. 11.5 Illustrate geo-textiles.	20	4

12	<b>CONSTRUCTION CHEMICALS &amp; WATER PROOFING MATERIALS AND BITUMEN</b> 12.1 Describe Construction chemicals/Admixture, PC based chemical and bitumen. 12.2 List of construction chemicals. 12.3 Mention the uses of construction chemicals. 12.4 Define waterproofing Materials. 12.5 list waterproofing materials. 12.6 Point out the uses of water proofing materials. 12.7 Mention the advantage of PC based Chemical. 12.8 Illustrate the use of Bitumen.	21	4
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### Final Exam

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### Practical Lesson Plan

SL No	Experiment Name	Class No	Marks
1	<b>CONDUCT FIELD TEST OF STONE</b> 1.1 Observe Color. 1.2 Observe Structure and Texture. 1.3 Determine Weight. 1.4 Determine Hardness. 1.5 Determine Toughness. 1.6 Observe Abrasion Resistance. 1.7 Maintain the record of performed tasks.	22	2
2	<b>CONDUCT LABORATORY TEST OF STONE</b> 2.1 Perform LA Test. 2.2 Perform Bard's test 2.3 Perform Acid Test 2.4 Perform Smith's Test 2.5 Perform Strength Test 2.6 Maintain the record of performed tasks.	23	3
3	<b>CONDUCT FIELD TEST OF BRICKS</b> 3.1 Identify 1st class, 2nd class, 3rd class bricks and jhama bricks 3.2 Determine Shape, Size and color. 3.3 Observe Soundness. 3.4 Observe Hardness. 3.5 Maintain the record of performed tasks.	24	3
4	<b>CONDUCT LABORATORY TEST OF BRICKS</b> 4.1 Perform Compression test 4.2 Perform Absorption test 4.3 Determine average weight of a brick. 4.4 Maintain the record of performed tasks.	25	3

5	<p>CONDUCT LABORATORY TEST OF CEMENT</p> <p>5.1 Make cement paste of Normal Consistency (CPNC).</p> <p>5.2 Determine initial setting time.</p> <p>5.3 Perform final setting time.</p> <p>5.4 Perform a compressive strength test.</p> <p>5.5 Perform tensile strength test.</p> <p>5.6 Perform a fineness test.</p> <p>5.8 Maintain the record of performed tasks.</p>	26	4
6	<p>CONDUCT FIELD TEST OF CEMENT</p> <p>6.1 Observe Date of Manufacturing.</p> <p>6.2 Observe Color.</p> <p>6.3 Observe Temperature inside cement bag.</p> <p>6.4 Observe Smoothness.</p> <p>6.5 Observe Water Sinking</p> <p>6.6 Observe smell of cement paste.</p> <p>6.4 Maintain the record of performance.</p>	27	3
7	<p>CONDUCT FIELD TEST OF SAND</p> <p>7.1 Observe Color.</p> <p>7.2 Observe Texture.</p> <p>7.3 Observe Salinity.</p> <p>7.4 Observe Smoothness.</p> <p>7.5 Maintain the record of performed</p> <p>PERFORM LABORATORY TEST OF SAND</p> <p>8.1 Create Bulking of sand.</p> <p>8.2 Find FM of sand.</p> <p>8.3 Determine Specific gravity of sand.</p> <p>8.4 Maintain the record of performed tasks.</p>	28	3
8	<p>PERFORM TEST OF MILD STEEL</p> <p>9.1 Perform Tensile strength Test.</p> <p>9.2 Demonstrate Elongation Test.</p> <p>9.3 Measure Diameter.</p> <p>9.4 Perform Bend and Rebend Test.</p> <p>9.5 Maintain the record of performed tasks.</p>	29	2
9	<p>OBSERVE WOOD AND ARTIFICIAL WOOD</p> <p>10.1 Identify Veneers, Plywood.</p> <p>10.2 Identify laminated board, Block board, Fiber board, Gypsum board. Maintain the record of performed tasks.</p>	30	2