



BANGLADESH TECHNICAL EDUCATION BOARD

Agargaon, Sher-E-Bangla Nagar

Dhaka-1207.

04-YEAR DIPLOMA IN ENGINEERING CURRICULUM COURSE STRUCTURE & SYLLABUS (PROBIDHAN-2022)

ARCHITECTURE TECHNOLOGY

TECHNOLOGY CODE: 61

4TH SEMESTER

(Effective from 2022-2023 Academic Sessions)

COURSE STRUCTURE

(PROBIDHAN-2022)

TECHNOLOGY NAME: ARCHITECTURE TECHNOLOGY (61)

(4TH SEMESTER)

Sl. No.	Subject		Period per Week		Credit	Marks Distribution						
						Theory Assessment			Practical Assessment			Grand Total
	Code	Name	Theory	Practical		Continuous	Final	Total	Continuous	Final	Total	
1	25811	Social Science	2	-	2	40	60	100	-	-	-	100
2	25841	Accounting	2	-	2	40	60	100	-	-	-	100
3	26141	Architectural Design-III	2	6	4	40	60	100	50	50	100	200
4	26142	History of Architecture-I	2	-	2	40	60	100	-	-	-	100
5	26143	Working Drawing -II	2	3	3	40	60	100	25	25	50	150
6	26144	Computer Aided Drawing -II	-	6	2	-	-	-	50	50	100	100
7	26434	Basic Construction Process	2	3	3	40	60	100	25	25	50	150
8	26447	Basic Estimating & Costing	2	3	3	40	60	100	25	25	50	150
Total			14	21	21	280	420	700	175	175	350	1050
Total Period			35									
Theory: Practical (%)			40.0%	60.0%								

SUBJECT CODE	SUBJECT NAME	PERIOD PER WEEK		CREDIT
26447	BASIC ESTIMATING & COSTING	T	P	C
		2	3	3
Rationale	Basic estimating & costing is the most important subject of the diploma in civil, architecture, surveying engineering student. It helps them to calculate project cost and materials analysis. It will provide the ability of quantity analysis of civil engineering works and enable to estimate volume, quantities of materials used in construction works and understanding cost abstract of civil engineering works. It will also improve knowledge and skill of estimating of quantity estimation of excavating pond, road embankment, canal digging, steps of a plinth height building, boundary wall, bituminous road & RCC road, plumbing and sanitary works and complete estimate of a simple building and two storied frame structure building and rate analysis as per PWD Standard.			
Learning Outcome (Theoretical)	After undergoing the subject, students will be able to • State the basic concept of estimating. • State the quantity of earth work in excavation of pond and embankment. • State the Estimating volume of earth work for canal digging. • Mention the different quantities of steps, boundary wall and roads. • Describe the procedure of estimating a simple building. • Describe the procedure of estimating of two storied frame structure building. • State the Estimating the plumbing and sanitary works. • Describe the procedure of quantity of materials for various items as per PWD standard. • Describe the Procedure of analysis of rates of various items as per PWD standard. • Describe the process of Preliminary estimate of building according to plinth area rate.			
Learning Outcome (Practical)	After undergoing the subject, students will be able to • Calculate the volume of earth work in excavating pond of a given cross-section, by mid area, Mean area and Prismoidal method. • Estimate the volume of earth work for canal digging. • Estimate of boundary wall as per drawing. • Estimate for making wooden chair, table, and almirah. • Calculate the quantity of Rectangular RCC beam, Column and Lintel. • Calculate the quantity of one way and two-way roof slab. • Calculate the quantity of a foundation details of frame structure building (Sub-structure) • Estimate the plumbing and sanitary works. • Calculate the cost per square meter for two storied residential building.			

DETAILED SYLLABUS (THEORY)

Unit	Topics with Contents	Class (1Period)	Final Marks
1.	BASIC CONCEPT OF ESTIMATING 1.1 Define Estimating. 1.2 State the methods of estimating. 1.3 Explain the measurements rules and methods of estimating works. 1.4 Mention the deduction rules of opening and bearing in masonry. 1.5 List the unit weight of different materials used in construction works. 1.6 Mention the unit of different items of works as per standard practice.	02	02
2	EARTH WORK EXCAVATING OF POND AND EMBANKMENT 2.1 State the rules to find out the volume of earth work by mid area, mean area and prismoidal method. 2.2 Mention the side slopes for different heights of road embankment. 2.3 Mention the cross section of road embankment. 2.4 State the method to find out the volume of earth work in embankment by mid area, mean area and prismoidal method.	02	05
3	EARTH WORK FOR CANAL DIGGING 3.1 State the different types of canal cross section. 3.2 Discuss the cross section of partly banking and partly cutting of a canal. 3.3 Explain the method to find out the volume of earth work for partly cutting and partly banking. 3.4 Explain lead and lift 3.5 Explain the procedure to calculate canal area of Landscape.	02	02
4	STEPS, BOUNDARY WALL AND ROADS 4.1 Mention different parts of a step up to plinth. 4.2 List different items of works in a boundary wall. 4.3 List different items of works in a bituminous road. 4.4 List different items of works in a RCC road.	02	04
5	ESTIMATION OF A SIMPLE BUILDING 5.1 State the center line and separate wall method. 5.2 Mention the advantage and disadvantage of center line and separate wall methods. 5.3 Explain deduction methods for opening. 5.4 Define sub-structure and super-structure. 5.5 List different building components along with calculation method.	03	05
6	ESTIMATION OF STRUCTURAL COMPONENT OF FRAME STRUCTURE BUILDING 6.1 State the earth work in excavation of column footing. 6.2 Mention the RCC work for column footing up to grade beam. 6.3 Mention the RCC work for grade beam. 6.4 Mention the RCC work for column up to roof level. 6.5 Mention the RCC work of floor beam. 6.6 Mention the quantity of RCC work in roof slab.	03	08
7	ESTIMATION OF FINISHING ITEM OF FRAME STRUCTURE BUILDING 7.1 State the calculation procedure of brick work in Ground floor. 7.2 Mention the calculation procedure of Plastering work in ground floor. 7.3 Discuss the calculation procedure of wood work for door frame and shutter. 7.4 Mention the calculation procedure of grill work in window and verandah.	04	08

	7.5 Explain the calculation procedure of aluminum sliding work for window and partition. 7.6 Explain the calculation procedure of interior wall painting work. 7.7 Mention the calculation procedure of exterior wall painting work. 7.8 State the calculation procedure of enamel painting work for window and verandah grill. 7.9 Mention the calculation procedure of polish work for door. 7.10 Explain the calculation procedure of tiles work in wall and floor.		
8	PLUMBING AND SANITARY WORKS 8.1 State estimating method of plumbing and sanitary works. 8.2 Mention different fittings and fixtures required for water supply and sanitary works. 8.3 Mention different types of pipes in water supply and sanitary works. 8.4 Describe estimation method of the drainage works for a building.	02	04
9	QUANTITY OF MATERIALS REQUIRED FOR VARIOUS ITEM OF WORK 9.1 State the procedure of required materials for Brick work of 250 mm & 125 mm thick wall with 1:6 and 1:4 cement mortar. 9.2 State the procedure of required materials for RCC work in proportion 1:2:4 and 1:1.5:3. 9.3 Explain the procedure of required materials for Mild steel reinforcement fabrication work in different types of RCC of work 9.4 Mention the procedure of Patent stone flooring in proportion 1:1.5:3 with neat cement finishing. 9.5 State the procedure of required materials for 20 mm thick cement plaster (1:4) with neat cement finishing. 9.6 State the procedure of required materials for distemper, plastic emulsion paint, synthetic enamel paint.	05	10
10	RATE ANALYSIS OF VARIOUS ITEMS AS PER PWD STANDARD FOR SUB-STRUCTURE 10.1 State the meaning of rate analysis. 10.2 Describe the purposes of rate analysis. 10.3 State the rate analysis of Earth work in excavation for foundation trenches. 10.4 Mention the rate analysis of the Earth and sand filling in foundation and plinth. 10.5 State the rate analysis of one layer brick flat soling in foundation and floor. 10.6 State the rate analysis of Cement concrete work (1:3:6) in foundation and floor. 10.7 State the rate analysis of Brick work in foundation up to plinth with 1:6 cement mortar. 10.8 State the rate analysis of 75 mm thick damp proof course (DPC) in proportion 1 :1.5: 3	05	08
11	PRELIMINARY ESTIMATE OF BUILDING ACCORDING TO PLINTH AREA RATE 11.1 State the meaning of preliminary estimate. 11.2 Mention the basis of calculating preliminary cost estimate of a building 11.3 Describe the calculation procedure of preliminary cost estimate for a Building according to plinth area rate.	02	04

		Total	32	60
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DETAILED SYLLABUS (PRACTICAL)

Sl.	Experiment Name	Class (3 Period)	Marks Continuous
1	Calculate the volume of earth work in excavating pond of a given cross-section, Mid area, Mean area and Prismoidal method. 1.1 Prepare a cross-section of pond for volume calculation. 1.2 Use given cross-section calculate volume of earth work by mid area, Mean area and Prismoidal method. 1.3 Maintain the record of performed task.	1	2
2	Estimate the volume of earth work for canal digging. 2.1 Prepare a cross-section canal partly banking and partly cutting. 2.2 Calculate the volume of earth work for canal. 2.3 Maintain the record of performed task.	1	2
3	Prepare an estimate of boundary wall as per drawing 3.1 Collect the drawing of brick pillar, RCC column and grade beam with section. 3.2 Use 25 cm x 25 cm brick pillar and 25 cm x25 cm RCC column and grade beam. 3.3 Find out brick work of the brick pillar 3.4 Find out RCC work of column and grade beam. 3.5 Maintain the record of performed task.	1	2
4	Prepare an estimate for making wooden chair, table, and almirah 4.1 Prepare or collect the drawing of a chair, table and almirah 4.2 Calculate the quantity of wood of chair, table and almirah. 4.3 Maintain the record of performed task.	1	2
5	Calculate the quantity of Rectangular RCC beam, Column and Lintel 5.1 Prepare a drawing of a Rectangular RCC beam, Column and Lintel. 5.2 Calculate the quantity of Rectangular RCC beam, Column and Lintel. 5.3 Maintain the record of performed task.	2	2
6	Calculate the quantity of one way and two-way roof slab 6.1 Collect a drawing of one way and two-way roof slab. 6.2 Calculate the quantity of one way and two way roof slab. 6.3 Maintain the record of performed task.	1	2
7	Calculate the quantity of a foundation details of a frame structure building for Sub-structure 7.1 Collect the details drawing of a foundation. 7.2 Calculate the quantity of earth work in excavation of foundation trenches. 7.3 Calculate the quantity of sand filling in plinth. 7.4 Calculate the quantity brick flat soling and mass concrete in foundation and floor. 7.5 Estimate the reinforced cement concrete work in foundation up to plinth level. 7.6 Calculate the quantity of brick work up to plinth level. 7.7 Maintain the record of performed task.	3	5

8	Calculate the details quantity of a Super-structure items of a frame structure building 8.1 Prepare or collect the details drawing of a frame structure building (Super-structure) 8.2 Calculate the quantity of brick work in ground floor and above (250 mm and 125 mm wall). 8.3 Estimate the cement plaster work on brick wall (1:6) and RCC surfaces (1:4). 8.4 Estimate the RCC work of ground floor and 1st floor. 8.5 Estimate the quantity of wood work in frame and shutters. 8.6 Estimate the wood, steel and aluminum work in window frames and shutters. 8.7 Estimate the grill and painting work for window and verandah. 8.8 Estimate the patent stone flooring and tiles works. 8.9 Estimate the quantity of distemper and plastic paints. 8.10 Estimate the varnishing works for doors. 8.11 Maintain the record of performed task.	4	5
9	Calculate the cost per square meter for two storied residential building 9.1 Prepare and collect the details drawing of two storied frame structure building. 9.2 Calculate details quantity of residential building. 9.3 Calculate the cost per square meter according to PWD standard. 9.4 Maintain the record of performed task.	2	3
	Total	16	25

NECESSARY RESOURCES (TOOLS, EQUIPMENT'S AND MACHINERY):

Sl	Item Name	Quantity
01	Laptop/PC	5 nos
02	Printer	2 nos
03	Scanner	2nos
04	Calculator	10 nos
05	Set Square	As Necessary
06	Tri angular Scale	As Necessary

RECOMMENDED BOOKS:

Sl	Book Name	Writer Name	Publisher Name & Edition
01	Estimating and costing in Civil Engineering	B N Datta	CBS, 28 th Edition
02	Estimating Costing and Valuation	Gurucharan Singh & Jagdish Singh	Standard Publishers Distributors, 3 rd Edition
03	Estimating Costing and Valuation	S.C Rangwala	Charotar Publishing house Pvt. Ltd.
04	Estimating and Costing	B. N. Shuresh	B. Harnath Raddy, 1 st Edition
05	A Text book of Estimating and	G. S. Birdie	Dhanpat Rai Publishing Company

	costing		
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WEBSITE REFERENCES:

Sl	Web Link	Remarks
01	www.youtube.com	Search here with topics
02	www.google.com	Search here with topics
03	https://www.youtube.com/watch?v=_J93aSK9Unc	Search here with topics
04	https://www.youtube.com/watch?v=h8Ufcvu0nKA	Search here with topics
05	https://www.youtube.com/watch?v=f6tT22VUNdM&t=44s	Search here with topics