

Program : <b>Diploma in Civil Engineering</b>	
Course Code : <b>4013</b>	Course Title: <b>Estimation and Costing</b>
Semester : <b>4</b>	Credits: <b>4</b>
Course Category: <b>Program Core</b>	
Periods per week: <b>4 (L:3, T:1, P:0)</b>	Periods per semester: <b>60</b>

### Course Objectives:

- To develop an awareness of those factors that affects the cost of construction work.
- To provide the student with the ability to estimate the quantities of item of works involved in buildings, water supply and sanitary works, road works and irrigation works, and also to equip the student with the ability to do rate analysis, valuation of properties and preparation of reports for estimation of various items.

### Course Prerequisites:

Topic	Course code	Course Title	Semester
Building Drawing and Estimating		CAD Lab	3
Engineering Mathematics		Engineering Mathematics	1 and 2
Building construction and construction materials		Building construction and construction materials	3

### Course Outcomes:

On completion of the course, the student will be able to:

CO <sub>n</sub>	Description	Duration (Hours)	Cognitive level
CO1	Understand the principles and procedure for estimation and costing of Civil Engineering works	13	Applying
CO2	Carryout the rate analysis of different items associated with construction projects	15	Applying
CO3	Prepare detailed estimates for infrastructure projects	18	Applying
CO4	Assess the property value and fix rent	12	Applying
	Series tests	2	

**CO-PO Mapping:**

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3						
CO2	3						
CO3	3						
CO4		3			3		

3-Strongly mapped, 2-Moderately mapped, 1-Weakly mapped

**Course Outline:**

Module Outcomes	Description	Duration (Hours)	Cognitive level
CO1	<b>Understand the principles and procedure for estimation and costing of Civil Engineering works</b>		
M1.01	Understand the purpose of estimation and the requirements of an estimator. Explain the rules of measurement as per IS:1200	3	Understanding
M1.02	List and explain different types of estimates.	2	Understanding
M1.03	Understand different stages of preparing detailed estimate.	2	Understanding
M1.04	Compute volume of earth work by different methods.	6	Applying

**Contents:**

Estimation and Costing - Meaning, purpose, Administrative approval, Technical Sanction and Budget provision.

Types of estimates - Approximate and Detailed estimate. Types and Uses of Estimates: Revised estimate, Supplementary estimate, Repair and maintenance estimate, renovation estimate. Roles and responsibility of Estimator.

Measurement Book, Abstract sheet, Face sheet. Modes of measurement and desired accuracy in measurements for different items of work as per IS:1200. Rules for deduction in different category of work as per IS:1200. Description / specification of items of building work as per PWD /DSR,

Approximate estimate - Definition, Purpose. Methods of approximate estimate - Service unit method, Plinth area rate method, Cubical content method, Typical bay method, Approximate quantity method

Detailed Estimate - Definition and Purpose, Data required for detailed estimate - Civil cost, GST, Contingencies, Supervision charges, Agency charges, Procedure for preparation of detailed estimate.

Earth work computation - Trapezoidal - mid section - mean section (trapezoidal) - Prismoidal formula - computation of earth work from Longitudinal section and Cross section (no transverse slope)

<b>CO2</b>	<b>Perform analysis of rates for different items associated with construction projects</b>		
M2.01	Understand the purpose and importance of rate analysis	3	Understanding
M2.02	Familiarize with Standard data book and Schedule of rates.	3	Understanding
M2.03	Prepare data and analysis of rates for various items of work.	5	Applying
M2.04	Familiarize the Indian standard specification connected with civil engineering construction works	4	Understanding
	Series Test I	1	
<b>Contents:</b> Rate Analysis: Definition, Purpose and importance, Lead (Standard and extra) , Lift, overhead charges, contractor's profit, water charges, overhead profit, Local Market Rate, Cost Index, Introduction to the use of CPWD data book and schedule of rates, Procedure for rate analysis Preparation of data and analysis of rates for various items of work connected with building construction and other civil engineering structures with reference to Indian Standard Specification.			
<b>CO3</b>	<b>Prepare detailed estimates and abstract of estimate for infrastructure projects</b>		
M3.01	Understand different methods of preparing Detailed Estimate.	3	Understanding
M3.02	Prepare detailed estimate and abstract of estimate of a flat roof and tiled roof building.	6	Applying
M3.03	Prepare detailed estimate and abstract of estimate of septic tank, open well, water tank, compound wall, road work	4	Applying
M3.04	Prepare detailed estimate for culvert and retaining wall.	5	Applying
<b>Contents:</b> Centre line method and long wall and short wall method Detailed estimate and abstract of estimate of various items of works for- single storied building with flat roof and one room building with tiled sloping roof (Hip roof), detailed estimate and abstract of estimate of septic tank, open well, water tank, compound wall, road work, culverts (without splayed wing wall), RCC Retaining walls			
<b>CO4</b>	<b>Assess the property value and fix rent</b>		
M4.01	Familiarize with different terms associated with valuation.	2	Understanding
M4.02	Compute Depreciation of properties by different methods	3	Applying

M4.03	Valuate real properties by different methods.	4	Applying
M4.04	Valuate landed properties by different methods.	3	Applying
	Series Test II	1	
<b>Contents:</b> Valuation - Explanation of terms, types of values, sinking fund, years purchase, Depreciation - Straight line method, constant percentage method, S.F method .Obsolescence. Valuation of real properties - rental method, profit based method, depreciation method. Valuation of landed properties - belting method, development method, hypothecated building scheme method. Rent calculation. Lease, Types of Lease, Free hold property and Lease hold property, Valuation Report.			

**Text /Reference:**

<b>T/R</b>	<b>BookTitle /Author</b>
T1	Datta, B.N., Estimating and Costing in Civil engineering, UBS Publishers Distributors Pvt. Ltd., New Delhi.
R2	Rangwala,S.C., Estimating and Costing, Charotar Publishing House PVT. LTD., Anand.
R3	Birdie,G.S., Estimating and Costing, Dhanpat Rai Publishing Company(P) Ltd. New Delhi.
R4	V N Vazirani& S P Chandola, Civil engineering Estimating and Costing, Khanna Publishers
R5	IS 1200-1968; Methods of measurement of Building & Civil Engineering works.
R6	Chakraborti,M., Estimating and costing, specification and valuation in civil engineering, MonojitChakraborti, Kolkata. 7. PWD Schedule of Rates.
R7	IS 1200-1968; Methods of measurement of Building & Civil Engineering works.
R8	CPWD Schedule of Rates for Delhi-2018
R9	CPWD Analysis of Rates for Delhi-2018, Vol I and II
R10	Ministry of Road Transport and Highways (MORT&H) Specifications and Analysis of Schedule of Rates.
R11	IRC SP: 20 Rural Roads Manual

**Online resources:**

<b>Sl. No</b>	<b>Website Link</b>
1	<a href="https://nptel.ac.in/">https://nptel.ac.in/</a>
2	<a href="http://egyankosh.ac.in/">http://egyankosh.ac.in/</a>
3	<a href="https://swayam.gov.in/">https://swayam.gov.in/</a>