

**GUJARAT TECHNOLOGICAL UNIVERSITY, AHMEDABAD, GUJARAT**

**COURSE CURRICULUM**

**COURSE TITLE: ESTIMATING AND COSTING**

**(COURSE CODE: 3355004)**

<b>Diploma Programme in which this course is offered</b>	<b>Semester in which offered</b>
Architectural Assistantship	5 <sup>th</sup> Semester

### 1. RATIONALE

Estimating and Costing is a vital part of any construction project after preparation of drawing. No project can begin without total estimation and costing. The entire cost of construction and the infrastructure used for the purpose of construction is estimated and the final costing is done on the basis of which a certain percentage of the project cost is paid to the architect and other consultants involved in the project. This course enables the students to calculate the estimated construction cost of a building. This course also enables the students to know the present material and labour cost and to differentiate between them. To estimate the construction cost of a designed building is very important for an architect as it helps him/her to work within a budget and also helps his/her clients to know the finance he/she would have to arrange at various stages of construction. Thus this course helps the students to work efficiently in the field of architecture.

### 2. LIST OF COMPETENCY

The course content should be taught and curriculum should be implemented with the aim to develop required skills in students so that they are able to acquire following competency

**Calculate the estimated construction cost of a given building and prepare different types of detailed estimates through rate analysis.**

### 3. COURSE OUTCOMES

The applied theory for this course should be taught and practical should be carried out in such a manner that students are able to acquire required learning out comes in cognitive, psychomotor and affective domain to demonstrate following course outcomes.

- i. Explain types of estimate and duties of an estimator
- ii. Undertake rate analysis of civil engineering works
- iii. Determine the rates of various items of civil works
- iv. Calculate estimated cost of civil construction projects

### 4. TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P)	Examination Scheme				
				Theory Marks		Practical Marks		Total Marks
L	T	S/P	C	ESE	PA	ESE	PA	
2	0	2	4	70	30	20	30	150

**Legends:** L-Lecture; T- Tutorial/Teacher guided theory Practice, S-Studio; P - Practical; C – Credit; ESE - End Semester Examination; PA - Progressive Assessment

## 5. COURSE CONTENT DETAILS

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
<b>Unit – I Introduction</b>	1a. Define Estimating 1b. Classify Estimates 1c. List Methods of preparing Approximate Estimate and Detailed Estimate.	1.1 Define term Estimating and Costing 1.2 Objectives of Estimating 1.3 Types of Estimate 1.3.1 Approximate Estimate 1.3.2 Detailed Estimate 1.4 Methods of preparing approximate Estimate 1.4.1 Service Unit Method 1.4.2 Plinth Area Method 1.4.3 Cubical Content Method 1.4.4 Typical bay Method 1.5 Data required to Prepare detailed Estimate 1.6 Methods of preparing detailed Estimate 1.6.1 Long wall-Short wall method 1.6.2 Center line Method
<b>Unit– II Modes of Measurement as per SP:27</b>	2a. Differentiate Modes of Measurement for various construction Items. 2b. Apply proper mode of measurement.	2.1 Introduction 2.2 Units of Measurement of Construction Item 2.3 Importance of Modes of Measurement 2.4 Modes of measurement of various construction items.
<b>Unit – III Rate Analysis</b>	3a. State and explain data required for rate Analysis. 3b. Explain Task Work 3c. Prepare Rate Analysis 3d. Conduct survey for current market rates.	3.1 Introduction 3.2 Necessity of rate analysis. 3.3 Data required for rate analysis. 3.4 Factors affecting rate analysis. 3.5 Task work. 3.5.1 Factors affecting task work. 3.5.2 Task work of various skilled and unskilled labour. 3.6 Schedule of Rate and Market Survey. 3.7 Rate analysis of various construction items
<b>Unit – IV Specification</b>	4a. Interpret and use brief specifications for given item of construction. 4b. Draft Specification . 4c. Explain Important of Specifications.	4.1 Definition, purpose & importance of specifications. 4.2 Types of specifications. 4.3 Design and drafting of specifications. 4.4 Specification writing for some useful items

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
<b>Unit – V Estimating</b>	5a. Calculate quantity of Construction item. 5b. Prepare Abstract Sheet. 5c. Prepare Schedule of Bar	5.1 Detailed Estimate 5.1.1 Detailed Estimate of Single Story residential building. 5.1.2 Detailed Estimate of R.C.C. Slab 5.1.3 Detailed Estimate of R.C.C. Beam 5.1.4 Detailed Estimate of R.C.C. Column with footing 5.1.5 Detailed Estimate of Septic tank with soak pit.

## 6. SUGGESTED SPECIFICATION TABLE WITH HOURS & MARKS (Theory)

Unit	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
I	Introduction	2	2	8	0	10
II	Modes of Measurement as per SP:27(1987)	4	2	4	4	10
III	Rate Analysis	4	2	4	4	10
IV	Specification	4	2	4	4	10
V	Estimating	14	6	10	14	30
<b>Total</b>		<b>28</b>	<b>14</b>	<b>30</b>	<b>26</b>	<b>70</b>

**Legends:** R = Remember U= Understand; A= Apply and above levels (Bloom's revised taxonomy)

**Note:** This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

## 7. SUGGESTED LIST OF EXERCISES/PRACTICALS

The practical/exercises should be properly designed and implemented with an attempt to develop different types of skills (**outcomes in psychomotor and affective domain**) so that students are able to acquire the competencies/programme outcomes. Following is the list of practical exercises for guidance.

*Note: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of certain outcomes in affective domain which would in turn lead to development of **Course Outcomes** related to affective domain. Thus over all development of **Programme Outcomes** (as given in a common list at the beginning of curriculum document for this programme) would be assured.*

*Faculty should refer to that common list and should ensure that students also acquire outcomes in affective domain which are required for overall achievement of Programme Outcomes/Course Outcomes.*

S. No.	Unit No.	Practical/ Exercises (outcomes in psychomotor domain)	Approx Hours Required
1	I	Interpret given Civil Engineering Drawing	2
2	II	Measure at least 10 Construction items using different modes	4
3	III	Perform Rate Analysis of at least 10 Construction items	4
4	IV	Draft specification of at least 10 Construction items	4
5	V	Prepare Estimate of following:	
		(1) Single Storeyed Residential building including one bed room hall kitchen ,bath and w/c with staircase	6
		(2) Septic Tank with Soak pit	2
		(3) R.C.C. Slab, Beam, Column with footing	6
<b>TOTAL</b>			<b>28</b>

### 8. SUGGESTED LIST OF STUDENT ACTIVITIES

Students may do following activities:

- i. Survey market for current rates of material, labour and the construction items.
- ii. Visit nearby Small construction site, where major construction activities carried out.
- iii. Prepare rate analysis of different construction items.
- iv. Draft specifications for various construction items
- v. Prepare estimate for given drawing.
- vi. Compare the actual analysis rates of items with the S.O.R.
- vii. Take measurements of any building and calculate quantity and cost

### 9. SPECIAL INSTRUCTIONAL STRATEGIES (if any)

Unit No.	Instructional strategy	Key Resources
I	Interpretation of Civil Engg. Drg	Drawing to be provided to Student
II	Methods of Measurement	SP: 27, Lecture
III	Rate Analysis	Market Survey
IV	Drafting Work Specification	Lecture
V	Estimation	Lecture, Visit to Nearby Construction Site

### 10. SUGGESTED LEARNING RESOURCES

#### A. List of Books

S.No.	Title of Book/Journals	Author	Publication
1.	Estimating and Costing	B.N.Dutta	Laxmi publications
2.	Estimating and Costing	S.C.Rangwala	Charotar Publishing House Private Limited, Anand
3	Hand book of Methods of Measurement of building works	SP:27(1987)	BIS
4	Schedule of Rates	Local Authority	R&B, PWD, CPWD, Irrigation etc.
5.	Estimating and Costing	M. C. Chakraborty	

6.	A textbook of Estimating and Costing	G. S. Birdie	
7.	Estimating and Costing	Vazirani and Chandola	

**B. List of Software/Learning Websites**

- i. Estimator
- ii. MS Project
- iii. [www.amazon.in/Estimating-Costing-Civil-Engineering-Dutta](http://www.amazon.in/Estimating-Costing-Civil-Engineering-Dutta)
- iv. [www.shiksha.com](http://www.shiksha.com)
- v. [www.nptel.com](http://www.nptel.com)
- vi.

**11. COURSE CURRICULUM DEVELOPMENT COMMITTEE****Faculty Members from Polytechnics**

- **Prof. P.A.Pandya**, Lecturer in Civil Engineering, Govt. Polytechnic, Himatnagar  
**Co-ordinator and Faculty Members from NITTTR Bhopal**
- **Prof. Dr. J.P.Tegar**, Professor & Head, Department of Civil & Environment Engineering
- **Prof. M. C. Paliwal**, Associate Professor, Department of Civil & Environment Engineering