



GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering (Part Time)

Subject Code: 2960601

SUBJECT NAME: ENGINEERING ECONOMICS, ESTIMATION & COSTING

SEmseter VI

Type of course: Professional Core

Prerequisite: Nil

Rationale:

Teaching and Examination Scheme:

Teaching Scheme			Credits C	Examination Marks				Total Marks
L	T	P		Theory Marks		Practical Marks		
				ESE (E)	PA (M)	ESE (V)	PA (I)	
3	0	2	4	70	30	30	20	150

Sr no	Content	Total hours	% Weightage
1	<p>Module 1:</p> <p>Part A: Basics of Economics Basic Principles and Methodology of Economics. Demand/Supply – elasticity – Government Policies and Application. Theory of the Firm and Market Structure. Basic Macroeconomic Concepts (including GDP/GNP/NI/Disposable Income) and Identities for both closed and open economies.</p> <p>Part B: Public Sector Economics Public Sector Economics –Welfare, Externalities, Labour Market. Components of Monetary and Financial System, Central Bank –Monetary Aggregates; Commercial Banks & their functions; Capital and Debt Markets.</p>	6	15
2	<p>Module 2: Elements of Business/Managerial Economics. Cost & Cost Control – Techniques, Types of Costs, Lifecycle costs, xBudgets, Break even Analysis, Capital Budgeting— NPV, ROI, IRR, Payback Period, Time value of money (present and future worth of cash flows).</p>	6	10
4	<p>Module 3: Estimation Definition, Units of measurements, types of estimates, Different methods of Estimation of civil works. Introduction to the process of Estimation, Estimated cost and its importance. Provisions of IS-1200 for working out quantities and deductions in civil works. Working out estimated cost for residential, industrial buildings and RCC works, Market survey of Basic materials, schedule of rates, Mass haul Diagrams, MEP works; BIM and quantity take-offs; Thumb rules for computation of material requirement for different materials in buildings, percentage breakup of the cost, cost sensitive index, Use of Computers in quantity surveying.</p>	12	30
5	<p>Module 4: Specifications-Types, requirements and importance, detailed specifications for buildings, roads, and industrial structures</p>	4	10
6	<p>Module 5: Rate Analysis-Purpose, importance and necessity of the same, factors affecting, task work, daily output from different equipment/ productivity, Determination of rate for various items of civil works.</p>	6	10
7	<p>Module 6: Tenders and contracts- Preparation of tender documents, importance of inviting tenders, contract types, relative merits, prequalification. general and special conditions of contract, termination of contracts, extra work and Changes, penalty and liquidated charges, Settlement of disputes, R.A. Bill & Final Bill, Payment of advance, insurance, claims, price variation, etc. Preparing Bids- Bid Price build up: Material,</p>	6	10



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	Labour, Equipment costs, Risks, Direct & Indirect Overheads, Profits; Bid conditions, alternative specifications; Alternative Bids. Bid process management		
8	Module 7: Valuation Definitions of value, price and cost, depreciation, sinking fund, different type of values and their significance, factors affecting value, rent and standard rent, Years purchase, valuation tables, Easement, types of easements, significance of easement in valuation, Methods of valuation of buildings and land, Estimation of values of different types of buildings and lands.	8	15

Term Work Assignments may include:

1. Deriving an approximate estimate for different types of buildings by approximate methods.
2. Detailed estimate for the following with the required material survey for the same.
 - a. Two storeyed Residential Bungalow
 - b. RCC structures and steel structures.
 - d. road work
3. Preparation of valuation report in standard Government form.
4. Assignments on rate analysis and specifications.
5. Assignment on MEP works.
6. Preparation of Bar bending schedule.

Text/Reference Books:

1. Mankiw Gregory N. (2002), Principles of Economics, Thompson Asia
2. V. Mote, S. Paul, G. Gupta(2004), Managerial Economics, Tata McGraw Hill
3. Misra, S.K. and Puri (2009), Indian Economy, Himalaya
4. Pareek Saroj (2003), Textbook of Business Economics, Sunrise Publishers
5. M Chakravarty, Estimating, Costing Specifications & Valuation
6. Joy P K, Handbook of Construction Management, Macmillan
7. B.S. Patil, Building & Engineering Contracts
8. Relevant Indian Standard Specifications.
9. World Bank Approved Contract Documents.
10. FIDIC Contract Conditions.
11. Acts Related to Minimum Wages, Workmen's Compensation, Contract, and Arbitration
12. Typical PWD Rate Analysis documents.
13. UBS Publishers & Distributors, Estimating and Costing in Civil Engineering: Theory and Practice including Specification and Valuations,2016



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14. Dutta, B.N., Estimating and Costing in Civil Engineering (Theory & Practice), UBS, Publishers, 2016

On completion of the course, the students will:

1. Be able to **Identify**¹ the importance of Economics and **assess**¹ the impact of public sector agencies and private sector businesses on Indian economy
2. Be able to **choose**¹ an investment option through comparison of cost and return with break even analysis and capital budgeting
3. Be able to **quantify**¹ the worth of a civil engineering structure by **anticipating**¹ the quantities of constituents, **derive**¹ their cost rates and build up the overall cost of the structure.
4. Be able to **interpret**² the technical specifications for various works to be performed for a project and **assess**¹ their impact on the cost of a structure.
5. **Formulate**¹ and **evaluate**¹ contracts and tenders in construction practices
6. **Determine**¹ the value of new and existing structures

Taxonomy of learning

1. *Cognitive domain: Analysing, evaluating, Creating*
2. *Cognitive domain: understanding*