Course Syllabus
Gyanmanjari Diploma Engineering College
Semester-5 (Diploma)

**Subject:** Estimate, Costing and Valuation – DETCV15214

**Type of course:** Professional Core

**Prerequisite:** Fundamentals of Civil Engineering, Engineering Drawing & Auto CAD, Building Materials & Construction Technology, Surveying, Basic Mathematics & Applied Mechanics and Structural Analysis

**Rationale:** Estimation, Costing, and Valuation are essential for effective financial planning and resource management in construction projects. They help in accurate budgeting, material selection, and cost control, ensuring projects are completed within financial constraints. Understanding these concepts prepares students for real-world challenges in civil engineering, real estate, and project management. Additionally, integrating digital tools and AI-based forecasting enhances accuracy, efficiency, and sustainability in modern construction practices.

**Teaching and Examination Scheme:**

| Teaching Scheme | | | Credits | Examination Marks | | | | | Total Marks |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Theory Marks | | Practical Marks | | CA | |
| CI | T | P | C | ESE | MSE | V | P | ALA | |
| 4 | 0 | 2 | 5 | 60 | 30 | 10 | 20 | 30 | 150 |

*Legends: CI-Class Room Instructions; T – Tutorial; P - Practical; C – Credit; ESE - End Semester Examination; MSE- Mid Semester Examination; V – Viva; CA - Continuous Assessment; ALA- Active Learning Activities.*

**Course Content:**

| Sr. No | Course content | hrs. | % Weightage |
|---|---|---|---|
| 1 | **Basics of Estimating & Costing**<br>Definition, purpose & terminologies (Provisional sum, prime cost, spot items, day work, administrative approval, etc.),Types of estimates (Approximate & detailed estimates), Role & responsibilities of an estimator, Modes of measurement & IS Code-based deduction rules, Introduction to Digital Estimation Tools – AutoCAD, MS Excel, | 9 | 15 |
| 2 | **Specifications for Civil Engineering Works**<br>Importance, types & principles of writing specifications, Detailed specifications for excavation, concrete, brick masonry, RCC work, plastering, painting, flooring, etc. Smart & Sustainable Construction Materials – AAC blocks, geo polymer concrete, GFRC, GGBS concrete, Comparison of Traditional vs. Modern Materials -- Cost, durability & sustainability aspects | 9 | 15 |
| 3 | **Detailed Estimation & Digital Tools**<br>Methods of detailed estimation (Long wall-short wall, center-line method), Bar bending schedule for reinforcement estimation, Earthwork quantity estimation using different methods, Introduction to digital tools for quantity estimation and Introduction to BIM (Building Information Modeling) | 12 | 20 |
| 4 | **Rate Analysis & Cost Forecasting**<br>Rate analysis definition, factors affecting task work, SOR (Schedule of Rates), Rate analysis for excavation, RCC, masonry, flooring, plastering, painting, etc, Impact of global supply chains & inflation and E-Tendering & Digital Procurement – How contractors bid for projects online | 12 | 20 |
| 5 | **Valuation of Property & Green building**<br>Cost, price & value – Concepts & differences, Types of property & valuation methods (Rental method, cost approach, income approach), Depreciation & obsolescence calculations, Valuation in Smart Cities & Smart Homes – How tech-based urban planning affects pricing, Green building concepts & eco-friendly materials, Rate analysis of green materials, Fly ash bricks, low-VOC paints, thermal insulation materials, Carbon Footprint, Cost analysis for net-zero buildings | 18 | 30 |

## Continuous Assessment:

| Sr. No. | Active Learning Activities | Marks |
|---|---|---|
| 1 | **Basics of Estimating & Costing**<br>Students will be divided into teams and assigned different building components (e.g., foundation, walls, roofing). Each team will estimate quantities and costs using AutoCAD, or MS Excel. And data pdf format upload on GMIU Web portal. | 10 |
| 2 | **Site Visit to a Construction Project**<br>Students will visit a real construction site to observe the estimation process, material procurement, and cost tracking. They will interact with site engineers and estimators to understand practical challenges in costing. and Brief report upload on GMIU Web portal. | 10 |
| 3 | **Valuation of Property & Real Estate Trends**<br>Students will analyze a real property's valuation using different valuation methods (rental method, cost approach, income approach). And data pdf format upload on GMIU Web portal. | 10 |
| | **Total** | **30** |

## Suggested Specification table with Marks (Theory): 60

| Distribution of Theory Marks (Revised Bloom's Taxonomy) | | | | | | |
|---|---|---|---|---|---|---|
| Level | Remembrance (R) | Understanding (U) | Application (A) | Analyze (N) | Evaluate (E) | Create (C) |
| Weightage % | 20% | 30% | 30% | 20% | - | - |

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.

## Course Outcome:

| After learning the course, the students should be able to: | |
|---|---|
| CO1 | Understand basic concepts, terminologies, and types of estimates. |
| CO2 | Interpret specifications for civil engineering works and materials. |
| CO3 | Apply estimation methods and digital tools for project costing. |
| CO4 | Analyze rate analysis, cost forecasting, and market trends. |
| CO5 | Evaluate valuation techniques and sustainable construction cost factors. |

## List of Practical:

| Sr. No | Descriptions | Unit No | Hrs. |
|---|---|---|---|
| 1. | Introduction to Estimation & Digital Tools (AutoCAD, PlanSwift, Revit, MS Excel) | 1 | 2 |
| 2. | Preparation of Approximate Estimates (Plinth Area, Cubic Rate, etc) | 1 | 2 |
| 3. | Detailed Estimation of a Small Building (Long Wall-Short Wall & Center Line Methods) | 3 | 2 |
| 4. | IS Code-Based Measurement & Deductions | 1 | 2 |
| 5. | Writing Specifications for Civil Works (Excavation, RCC, Brick Masonry, Plastering, Flooring, etc.) | 2 | 2 |
| 6. | Comparative Study of Smart & Sustainable Construction Materials | 2 | 2 |
| 7. | Bar Bending Schedule (BBS) for Slabs, Beams & Columns | 3 | 2 |
| 8. | Earthwork Quantity Estimation | 3 | 2 |
| 9. | Detailed Estimation of Building Components- Beams | 3 | 2 |
| 10. | Detailed Estimation of Building Components - Columns | 3 | 2 |
| 11. | Detailed Estimation of Building Components -Slabs | 3 | 2 |
| 12. | Detailed Estimation of Building Components -Footings and Staircases | 3 | 2 |
| 13. | Property Valuation & Depreciation Calculation | 5 | 2 |
| 14. | Green Building Costing & Carbon Footprint Calculation | 5 | 2 |
| 15. | Site Visit & Case Study on Estimation & Valuation | - | 2 |
| **TOTAL** | | | **30** |

## Instructional Method:

The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of the tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.

From the content 10% topics are suggested for flipped mode instruction.

Students will use supplementary resources such as online videos, NPTEL/SWAYAM videos, e-courses, Virtual Laboratory

The internal evaluation will be done on the basis of Active Learning Assignment

Practical/Viva examination will be conducted at the end of semester for evaluation of performance of students in laboratory.

## Reference Books:

[1] Estimating and Costing in Civil Engineering – S.C. Rangwala, Charotar Publishing House Pvt. Ltd., Anand (Gujarat), ISBN: 9789385039058

[2] Estimating and Costing – Prof. V.N. Vazirani and Prof. S.P. Chandola, Khanna Publishers, ISBN-10: 8174091270, ISBN-13: 978-8174091277

[3] Building Information Modeling (BIM) in Construction: Fundamentals and Applications – Hardin, Brad, and McCool, Dave, Wiley, 2015, ISBN: 9781118942765

[4] Green Building Costs with Life Cycle Analysis – Srikrishna K, Iyer, Routledge, 2019, ISBN: 9780367225990

[5] Construction Cost Estimating for Project Control – Peurifoy, Robert L., Oberlender, Garold D., McGraw Hill, 2013, ISBN: 9780073398013