

Quantity & Cost Estimation

Course Code	Credit Hours
CE-214	2-1

Course Description

This course is designed to provide an overview of the Building construction management and in depth working of quantity and cost estimation. On successful completion, students will be able to prepare plans for building construction applying the learnt techniques; Perform basic, intermediate and advanced building construction measurements, compute quantities and cost from relevant drawing and schedule of rates using standard engineering methods; Prepare bill of quantities for project estimation, prepare store requirements for procurement and incorporation in work and prepare and analyses tendering, deviation orders and interim and final payment certificates

Text Book:

1. Marks Kalin, Robert S Weygant, Harold J. Rosen & John R. Regengar, Construction Specification Writing: Principles and Procedures (2010), Wiley.
2. Steven J Peterson and Frank R. Dagostino, (2015) Estimating in Building Construction 8th Edition,.. Pearson Publishing.
3. Steven J Peterson, Construction Estimating using Excel (2017) 3rd Edition Pearson Publishing
4. Standard Form of Bidding Documents by Pakistan Engineering Council.
5. David Chappel, Construction Contracts Questions and Answers (2021), 4th Edition, Taylor & Francis, Jemmmie Henzem Construction Contracts (2010), 3rd Edition, McGraw- Hill
6. MES CSR 2021

Reference Book:

1. Construction Cost Estimating 1st Edition by Len Holm (Author), John E. Schaufelberger (Author)
2. Construction Cost Management: Learning from Case Studies 2nd Edition by Keith Potts (Author), Nii Ankrah (Author)
3. Popescu, C.M., Phaobunjong, K. and Ovararin, N. (2003). Estimating Building Costs. Marcel Dekker, Inc.
4. Peurifoy, R.L. and Oberlender, G.D. (2002). Estimating Construction Costs. McGraw-Hill.

5. Holm, L., Schauffelberger, J.E., Griffin, D. and Cole, T. (2004). Construction Cost Estimating: Process and Practices. Prentice Hall.
6. Willis, C.J. and Newman, D. (1988). Elements of Quantity Surveying. BSP Professional Books.
7. Dutta, B.N. (2008). Estimating and Costing in Civil Engineering: Theory and Practice. UBS Publishers.

Prerequisites :

Nil.

ASSESSMENT SYSTEM FOR THEORY

	Without Project (%)	With Project/Complex Engineering Problems (%)
Quizzes	15	10-15
Assignments	10	5-10
Mid Terms	25	25
Project	-	5-10
End Semester Exam	50	45-50

ASSESSMENT SYSTEM FOR LAB

Lab Work/ Psychomotor Assessment/ Lab Reports	70%
Lab Project/ Open Ended Lab Report/ Assignment/ Quiz	10%
Final Assessment/ Viva	20%

Teaching Plan

Week No	Topics/Learning Outcomes
1	Review of basic take-off mathematics and measurement tools, Takeoff Rules and Measurement Accuracy
2	Types and Methods of Estimates (Conceptual estimates, Preliminary Estimates, Detailed estimates)
3	Organization of take-off, Estimate setup, Sources of Estimating Errors, Maintaining of Measurement Books
4	Quantity takeoff and pricing of Labor, Material and Equipment for sitework
5	Quantity takeoff and pricing of concrete,

	Rate Analysis, Cost Analysis of Construction Materials
6	Quantity takeoff and pricing of Masonry
7	Quantity takeoff and pricing of Carpentry, and Finishes Works
8	Case study- Estimation procedures and considerations for concrete retaining wall, Piles, Steel Truss, Road, Sewer and Water Main Pipe Works.
9	Mid Semester Exam
10-13	Development of Estimates, Pricing, and related Aspects
10	Labour Productivity and pricing of Labor
11	Pricing of Material and Equipment for sitework
12	Overhead Profit, Escalation, Contingency, Life-cycle Costing and Analysis
13	Use of different types of indices for conceptual estimates, Concept of Cost Code, Specifications and their types for various items of construction projects, Estimation Using Software, Application of AI and BIM for estimation.
14-16	Conceptual Aspects Related to Bidding
14	Overview of payment schemes in construction projects
15	Overview of Standard form of contract/ bidding documents with special references to clauses related to cost related issues of projects (such as PEC, FIDIC, AIA, etc.), General practices in government departments for schedule of rates and specifications
16	Preparation of Civil Engineering tender/ bid proposal documents, evaluation methods of proposals and bids, Preparation of Bid Documents for bid submissions
17-18	End Semester Exam

Practical

Experiment No	Description
1	Naviswork: Introduction to Naviswork, user interface, project creation, catalogs
2	BOQ in Naviswork: Quantification, object selection, DWF Takeoff, 2D Takeoff, simulations

3	<p>Primavera P6:</p> <p>Introduction to Primavera, Enterprise Project Structure, Organizational Breakdown Structure, user interface, Calendar,</p>
4	<p>Projects Planning / Scheduling in Primavera:</p> <p>Creating a Project, adding activities, adding resources, assigning resources, adding relationships, Creating WBS,</p>
5	<p>Project Reporting in Primavera:</p> <p>Budget at Completion, Costs, Creating Baseline, reporting base, Reporting performance, project website</p>