

CIPE3007 CONSTRUCTION MANAGEMENT AND PROFESSIONAL PRACTICE (3-0-0)

Course objective:

1. To understand the process to prepare the specification for a building and to estimate the cost involved in the construction
2. To calculate the rates of different essential items for a construction project.
3. To write detailed contract specifications for materials, equipment, and construction methodologies for various construction projects.
4. To demonstrate their ability to use various project management tools for planning, scheduling, and controlling time and costs on different infrastructure projects.

Module-I

Introduction to estimation, Units of measurement, Types of estimation, Methods of approximate estimation, Detailed estimation (Long wall/short wall method and Centre line method), Estimation of earthwork, sanitary & water supply works, irrigation works and road works. Estimation of materials in buildings, Culverts and bridges. Specifications-Types, requirements and importance, detailed specifications for buildings, roads, minor bridges and industrial structures. Basis of Bar Bending Schedule (BBS), BBS of beam, column, one way & two way slabs and isolated foundation.

Module-II: (08 hours)

General specification and detailed specification for different building items & structural works, and Methods of valuation of a building. Rate Analysis-Purpose, importance and necessity, factors affecting Analysis of rates, Prime cost, Schedule rates, Analysis of rates for various types of works. Analysis of rates for earthwork, brickwork, reinforced cement concrete work and plastering. Types of construction contract, Elements of a contract document, Different methods of carrying out work contract, Measurement book, and Method of tendering, Tender- Types of Tender, Preparation of tender documents, inviting tenders, general and special conditions, contract types. termination of contracts, penalty and liquidated charges, Settlement of disputes, Arbitration, R.A. Bill & Final Bill, Payment of advance, insurance, claims, price variation, Introduction to e-tendering.

Module-III

Project Management: Project Planning, Scheduling and Controlling, Bar charts: Development of Bar charts and its shortcomings. Network techniques: Event, activity, Dummy activity. Network rules, Numbering of events, Critical Path Method, Critical activities, Slack, Project Evaluation and Review Techniques (PERT), Network rules, Work breakdown structure, Elements of PERT and CPM and Project crashing, Time estimates, Different types of Float of activity, Probability of meeting schedule date for the project.

Module-IV

Cost Model: Project cost, indirect and direct cost, slope of direct cost curve, optimum project duration, contracting the network for cost optimization. Introduction to updating, resources smoothing and resources levelling. Quality Control: Quality Control by Statistical Methods, Sampling Plan, Control Charts, X Chart, R Chart, C chart and P Chart. Introduction to construction safety.

Course outcomes: At the end of the course, the students are expected to

- Estimate the quantities of materials and costs for various construction projects, including buildings, irrigation works, and road works.
- Perform rate analysis for the various construction projects and Prepare contract documents for a given project.
- Apply various material & equipment management techniques to ensure quality control
- Optimize the time and cost of a construction project using various project management tools.

Books:

1. M Chakraborti, Estimating, Costing, Specification & Valuation In Civil Engineering.
2. B.N. Dutta, Estimating and Costing in Civil Engineering Theory & Practice, UBS Publishers
3. L.S. Sreenath PERT and CPM, East West Pres.
4. B.S. Patil Civil engineering contracts and estimates by, University Press

5. B Sengupta & H Guha Construction Management and Planning, Tata McGraw Hill