Construction Project Management

01CI1703

Objective of the Course:

- To study Principles of Project Planning and Management.
- To provide students with exposure to Construction Project Management techniques for handling the large and complex projects.
- Introduce to Project cost optimization and its Management.
- Develop an understanding of Project Scheduling.

Credit Earned: 04

Student's learning outcomes:

After successful completion of the course, it is expected that students will be able to,

- Apply principles of quality, safety, equipment, material, and account management in real-world construction project scenarios.
- Develop Bar Charts, Milestone Charts, and Network Diagrams by dividing project tasks into activities and events.
- Estimate project duration, resource allocation, and cost optimization using CPM and PERT methods.
- Analyze project organization, scheduling, and cost optimization techniques to improve project management efficiency.

Teaching and Examination Scheme

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial/ Practical Marks		Total Marks
Theory	Tutorial	Practical		ESE (E)	IA (M)	CSE (I)	Viva (V)	Term Work (TW)	
03	01	00	04	50	30	20	25	25	150

Detailed Syllabus

Sr. No	Topic name	Hours
1	**Introduction**	**3**
	1.1 A construction project, Phases of construction project, Importance of construction and construction industry, Indian construction industry	3

	need of construction management, Stakeholders of construction management.	
2	**Project Organization and Management Techniques**	**7**
	2.1 Construction company structure of construction organization, Organizing for construction project management, Management levels, Traits of project manager and co-ordinators.	3
	2.2 Ethical conduct for engineers, Factors for success of a construction organization.	1
	2.3 Conventional project management techniques, Network oriented project management techniques, its importance and application	3
3	**Construction Economics**	**2**
	3.1 Economic decision making, Evaluating alternatives, Effect of taxation on comparison of alternatives, Effect of inflation on cash flow, Evaluation of public projects, Benefit cost ratio method.	2
4	**Construction Planning**	**5**
	4.1 Types of project plans, Work break down structure	2
	4.2 Bar charts, CPM and PERT network analysis, Precedence network ladder network, Line of balance method.	3
5	**Project Scheduling and Resource Levelling**	**6**
	5.1 Resource allocation, Importance of project scheduling, Network crushing and cost time trade off, Types of Schedules, Material Schedule, Labour Schedule, Equipment Schedule, Resource Smoothing and Resource Levelling Techniques.	**6**
6	**Construction Accounts & Material Management**	**8**
	6.1 Principles of accounting, accounting process construction contract revenue recognition, Construction contract status report, Limitation of accounting, Balance sheet, Profit and loss account, Working capital, Ratio analysis, Fund flow statement.	**4**
	6.2 Material management functions, Inventory management, Selective Inventory Control, Job layout, Factors affecting Job Layout, Advantages of Job Layout, Preparation of Job Layout.	**4**
7	**Construction Project Cost & Cost and Value Management**	**3**
	7.1 Project cost management, Collection of cost related information, Cost codes, Cost statement, Value management in construction, Steps, Value engineering application in a typical case project.	
8	**Construction Quality and Safety management**	**8**
	8.1 Construction quality, Inspection, Quality control and Quality assurance in projects, Total quality management, Quality gurus and their teaching cost of quality ISO standards, Principles of quality management systems, (CONQUAS) construction quality assessment system.	4
	8.2 Evolution of safety, Accident causation theory, Unsafe conditions, Unsafe acts health and safety act and regulation cost of accidents, Role of safety personnel, Accident causes and principles of safety, Safety and health management system.	4
	TOTAL	**42**

List of Tutorials

Sr. No	Topic name	Hours
1	Work Breakdown Structure	1
2	Bar Chart and Milestone Chart	1
3	Line of Balance Technique	1
4	Classification of Activities and Events	1
5	Draw the Network Diagram	1
6	Critical Path Method	2
7	PERT Method	1
8	Cost Optimization	2
9	Resource Smoothing Technique	1
10	Resource Levelling Technique	1
11	Resource Scheduling	1
12	Construction Accounting – Balance Sheet and Profit & Loss	1

Suggested Theory Distribution

The suggested theory distribution as per Bloom's taxonomy is as per follows. This distribution serves as guidelines for teachers and students to achieve an effective teaching-learning process

Distribution of Theory for course delivery and evaluation					
Remember	Understand	Apply	Analyze	Evaluate	Create
5%	10%	30%	30%	15%	10%

Instructional Method and Pedagogy:

1 Prerequisite of the course and its pattern shall be discussed on the commencement of the course.
2 Lectures shall be conducted in class room using various teaching aids.
3 Presence in all academic sessions is mandatory which shall carry 5% marks of the total internal evaluation.
4 At the end of each unit/topic an assignment based on the course content shall be given to the students which shall carry 5% weightage for timely completion and submission of the assigned work.
5 The Tutorials are planned in such a way that it covers the practical aspects of the course contents. The performance of these experiments shall bring the clarity of the theoretical concepts which the students have studied during the academic sessions.

Recommended Study Material

1. Construction project management: Theory and Practices, 2nd edition, 2016, Kumar Niraj Jha, Pearson Education Publishers.

2. Project management for engineering and Construction, By Garold D Oberlender, 2nd Edition, McGraw Hill Education (India), Pvt. Ltd.
3. CPM and PERT: Punamia& Khandelwal.
4. Construction planning and management, P S Gehlot and B M Dhir, Wiley Eastern Ltd.
5. A management guide to PERT/ CPM by Weist and Levy, Prentice Hall
6. Construction management, P PDharwadkar.
7. Construction of Structures and Management of Works, S. C. Rangwala, Charotar Publications.

Web Links

1. https://onlinecourses.nptel.ac.in/noc24_mg01/preview
2. https://onlinecourses.nptel.ac.in/noc19_mg30/preview
3. https://archive.nptel.ac.in/courses/110/104/110104073/