SEMESTER S6

CONSTRUCTION PROJECT MANAGEMENT

Course Code	PBCET604	CIE Marks	60
Teaching Hours/Week (L: T:P: R)	4	ESE Marks	40
Credits	3:0:0:1	Exam Hours	2 Hrs. 30 Min.
Prerequisites (if any)	-	Course Type	Theory

Course Objectives:

1. Introduce students to the fundamentals of construction project management and planning.
2. Covers techniques for planning and scheduling construction projects, as well as methods for monitoring and controlling them.
3. Provides insights into the applications of Building Information Modelling (BIM) in construction.
4. Ensure that students become proficient in construction project planning and management by combining theoretical concepts with practical exercises using various software tool.

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SYLLABUS

Module No.	Syllabus Description	Contact Hours
1	Construction projects, life cycle of a project – phases in a project. Tendering: types of tenders, stages in tendering. Process of development of plans and schedules – work break-down structure, estimating durations. Types of Schedules – Construction schedule, Material schedule, labour schedule, equipment schedule, financial schedule. Techniques of planning – Bar charts, Mile Stone Charts. Network representation – Activity on Arrow (AoA) or Activity on Node (AoN) Diagram. Network analysis – Critical Path Method (CPM), Programme Evaluation and Review Technique (PERT) – concepts and problems.	9

	Precedence Diagramming Method – types of relationships – concept of lead and lag. Concept only	
2	Handling resources on projects, resource constraints and conflicts, resource allocation and resource levelling. Concept only Time-Cost trade-off on construction projects – Classification of costs, compression of networks, cost optimization through the crashing of a network.	**9**
3	Updating project schedules. Project control, Schedule/time/progress control, periodic progress reports. Concept of Time-cost monitoring and control using S-curve, Earned value analysis – measures of performance.	**9**
4	Introduction to BIM Technology: Define BIM and BIM model, describe workflow in using BIM in the building lifecycle, Model-Based cost estimating, Perform Simulations, Apply BIM to reduce error and change orders in projects, Evaluate and communicate ideas related to the use of BIM in the building life cycle, BIM Benefits: Case Studies, Organizational Maturity and Dimensions, Construction Management and Planning using BIM.	**9**

Suggestion on Project Topics:

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Project based learning (8 hrs)

Steps of Detailed Project Planning:

1. Develop basic drawings of a construction project (Preferably Residential/ small commercial building; G+1 building maximum)-Use drafting software for developing plan
2. Approximate estimation of quantities and rates, development of BOQ for the project -Use spread sheet or similar software
3. Develop a Gantt chart/ Precedence Network of the project and identify the critical path and floats. (use suitable planning software)
4. Develop a resource schedule for the selected project
5. Submit the completed files as project planning report

Course Assessment Method

(CIE: 60 marks, ESE: 40 marks)

Continuous Internal Evaluation Marks (CIE):

Attendance	Project	Internal Ex-1	Internal Ex-2	Total
5	30	12.5	12.5	60

End Semester Examination Marks (ESE)

In Part A, all questions need to be answered and in Part B, each student can choose any one full question out of two questions

Part A	Part B	Total
• 2 Questions from each module. • Total of 8 Questions, each carrying 2 marks **(8x2 =16 marks)**	2 questions will be given from each module, out of which 1 question should be answered. Each question can have a maximum of 2 sub divisions. Each question carries 6 marks. **(4x6 = 24 marks)**	**40**

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Course Outcomes (COs)

At the end of the course students should be able to:

Course Outcome		Bloom's Knowledge Level (KL)
CO1	Describe the procedure for planning and executing public works.	**K1**
CO2	Apply scheduling techniques in construction project planning	**K3**
CO3	Optimize resource requirements in construction projects.	**K3**
CO4	Apply earned value analysis for monitoring the schedule and cost performance of construction projects.	**K3**
CO5	Demonstrate the application of BIM in construction management and planning.	**K3**

Note*: K1- Remember, K2- Understand, K3- Apply, K4- Analyse, K5- Evaluate, K6- Create*

CO-PO Mapping Table:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	-	-	-	-	-	-	-	-	-	1	-
CO2	3	3	-	-	2	-	-	1	-	-	2	-
CO3	3	3	-	-	3	-	-	1	-	-	2	-
CO4	3	3	-	-	3	-	-	1	-	-	3	-
CO5	3	3	-	-	3	-	-	1	-	-	-	-

Text Books				
Sl. No	**Title of the Book**	**Name of the Author/s**	**Name of the Publisher**	**Edition and Year**
1	Construction Project Management Theory & Practice	Jha K. N	Pearson India Education Services Pvt. Ltd.	2nd edition, 2015
2	Construction Management and Planning	Sengupta B. and Guha H.,	McGraw Hill	1995
3	BIM and Construction Management: Proven Tools, Methods and Workflows.	Hardin B. and McCool D	John Wiley and Sons Inc.,	2015

Reference Books				
Sl. No	**Title of the Book**	**Name of the Author/s**	**Name of the Publisher**	**Edition and Year**
1	Modern Construction Management	Harris F., McCaffer R., Baldwin A. and Edum-Fotwe F.,	Wiley-Blackwell	8th Edition, 2021
2	Construction Engineering and Management	Sharma S. C. and Deodhar S. V.	Khanna Publishing	2019
3	Construction Project Management: Planning, Scheduling and Controlling,	Chitkara, K. K.	Tata McGraw-Hill Education	3rd Edition, 2014

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Video Links (NPTEL, SWAYAM…)	
Module No.	**Link ID**
1	archive.nptel.ac.in/courses/105/104/105104161/
2	archive.nptel.ac.in/courses/105/103/105103093/

PBL Course Elements

L: Lecture (3 Hrs.)	**R: Project (1 Hr.), 2 Faculty Members**		
	Tutorial	**Practical**	**Presentation**
Lecture delivery	Project identification	Simulation/ Laboratory Work/ Workshops	Presentation (Progress and Final Presentations)
Group discussion	Project Analysis	Data Collection	Evaluation
Question answer Sessions/ Brainstorming Sessions	Analytical thinking and self-learning	Testing	Project Milestone Reviews, Feedback, Project reformation (If required)
Guest Speakers (Industry Experts)	Case Study/ Field Survey Report	Prototyping	Poster Presentation/ Video Presentation: Students present their results in a 2 to 5 minutes video

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Assessment and Evaluation for Project Activity

Sl. No	Evaluation for	Allotted Marks
1	Project Planning and Proposal	5
2	Contribution in Progress Presentations and Question Answer Sessions	4
3	Involvement in the project work and Team Work	3
4	Execution and Implementation	10
5	Final Presentations	5
6	Project Quality, Innovation and Creativity	3
Total		**30**

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1. **Project Planning and Proposal (5 Marks)**
   - Clarity and feasibility of the project plan
   - Research and background understanding
   - Defined objectives and methodology

2. **Contribution in Progress Presentation and Question Answer Sessions (4 Marks)**
   - Individual contribution to the presentation
   - Effectiveness in answering questions and handling feedback

3. **Involvement in the Project Work and Team Work (3 Marks)**
   - Active participation and individual contribution
   - Teamwork and collaboration

4. **Execution and Implementation (10 Marks)**

    - Adherence to the project timeline and milestones
    - Application of theoretical knowledge and problem-solving
    - Final Result

5. **Final Presentation (5 Marks)**

    - Quality and clarity of the overall presentation
    - Individual contribution to the presentation
    - Effectiveness in answering questions

6. **Project Quality, Innovation, and Creativity (3 Marks)**

    - Overall quality and technical excellence of the project
    - Innovation and originality in the project
    - Creativity in solutions and approaches

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