

Branch Name:	Civil Engineering
Program Code:	ET106
Course Name:	Construction Planning & Management
Course Code:	2ET1060702T
Pre-requisite Course:	An introductory knowledge of Surveying, and Engineering Drawing along with some basic understanding of Construction Technology and Civil Engineering practices.

Course Objective:

1. Student can demonstrate an ability to develop the various components of project controls including planning, scheduling, cost and resource management.
2. Students will be able to demonstrate planning, scheduling and monitoring of projects using professional software.

Teaching and Examination Scheme:

Credit	Teaching Scheme Hours per week				Evaluation Scheme (Marks)								
					Theory (Marks)				Practical (Marks)				Total (Marks)
	L	T	P	Total	SEE		CCA		SEE		CCA		
					Min	Max	Min	Max.	Min	Max	Min.	Max.	
3	3	-	-	3	24	60	16	40	-	-	-	-	100

Subject Contents:

Sr. No	Topic	Total Hours	Weightage (%)
1	Introduction to Construction Management: Construction projects & their features, Purpose and functions of construction management, Construction management process & scope, Construction project life cycle, Construction project organisations, Project Team and their roles, Relevance of construction management in project success.	5	10
2	Introduction to Construction Project Planning: Work Breakdown structure (WBS), Planning & Scheduling inputs/data, Tools for project scheduling: Bar charts, Network diagrams, LOB method.	5	10
3	Project Scheduling using CPM: Concept of Activity on Arrow (AOA) and Activity on Node (AON), network representation, rules for drawing networks, dummy activities. Forward pass and backward pass methods, calculation of earliest start time (EST), latest start time (LST), earliest finish time (EFT), and latest finish time (LFT). Definition of critical path, identification of critical activities, significance in project duration. Types of floats, Total float, Free float, Independent float, and their calculations and importance. Preparation of time-scaled network diagrams and their use in visualization of project schedule. Allocation of labour, materials, and equipment; resource smoothing and leveling basics.	10	25
4	Project Monitoring & Cost Control using CPM: Updating of network based on actual progress, revising schedules, handling delays. Concept of crashing, cost slope, direct and indirect costs, optimum project duration. Tracking project cost with respect to schedule, comparison of planned vs actual cost. Analysis of schedule variance and cost variance using network techniques.	8	20

	Concepts of Planned Value (PV), Earned Value (EV), Actual Cost (AC), performance indices like Cost Performance Index (CPI) and Schedule Performance Index (SPI).		
5	Advanced Networks and Scheduling Concepts/Tools: PERT Network Analysis, Precedence Network Analysis, Line of Balance Methods.	6	15
6	Introduction to Software for Project Planning & Scheduling: MS PROJECT/PRIMAVERA.	8	20
Total		42	100

Course Learning Outcome:

CO1: Explain the concepts of construction management, project life cycle, and roles of project participants.

CO2: Apply project planning techniques such as WBS, bar charts, network diagrams, and Line of Balance (LOB).

CO3: Develop and analyze CPM networks (AOA/AON) to determine critical path, floats, and project duration.

CO4: Evaluate project performance using monitoring techniques, time-cost optimization, and Earned Value Analysis (EVA).

CO5: Use advanced scheduling methods and software tools like MS Project and Primavera for project planning and control.

Reference Books:

1. Sharma, M.R., Fundamentals of Construction Planning and Management, S.K. Kataria & Son, New Delhi, 2012
2. Seetharaman, S., Construction Engineering & Management, Umesh Publications, 2007.
3. Srinath, L.S., PERT & CPM Principles and Applications, Tata McGraw Hill, New Delhi.
4. Peurifoy, L., Schexnayder, C.J. and Shapira, A., Construction Planning, Equipment and Methods, McGraw Hill, New Delhi, 8th Edition, 2010.
5. Punamia, B.C. and Khandelwal, K.K., Project Planning and Control with PERT and CPM, Laxmi Publications, New Delhi, 2004.
6. Gahlot, P.S. and Dhir, B.M., Construction Planning & Management, New Age International (P) Ltd., New Delhi
7. Chitkara, K. K., Construction Project Management Planning, Scheduling and Controlling, Tata McGraw Hill, New Delhi.

List of Open-Source learning website:

1. [NPTEL \(https://nptel.ac.in/?utm_source\)](https://nptel.ac.in/?utm_source)
Free courses on construction management and project planning.
2. [SWAYAM \(https://swayam.gov.in/?utm_source\)](https://swayam.gov.in/?utm_source)
Government of India online learning platform.
3. [Coursera \(https://www.coursera.org/?utm_source\)](https://www.coursera.org/?utm_source)
Courses on project management and scheduling.
4. [edX \(https://www.edx.org/?utm_source\)](https://www.edx.org/?utm_source)
Professional courses from global universities.
5. [MIT OpenCourseWare \(https://ocw.mit.edu/?utm_source\)](https://ocw.mit.edu/?utm_source)
Free lecture notes and course materials.

Course Learning Outcomes (CLO):

After successful completion of the course the students shall be able to:

CLO	Description	Bloom's Taxonomy Level
CLO1	Explain the concepts of construction management, project life cycle, and roles of project participants.	L-1, L-2
CLO2	Apply project planning techniques such as WBS, bar charts, network diagrams, and Line of Balance (LOB).	L-3
CLO3	Develop and analyze CPM networks (AOA/AON) to determine critical path, floats, and project duration.	L-4
CLO4	Evaluate project performance using monitoring techniques, time-cost optimization, and Earned Value Analysis (EVA).	L-5
CLO5	Use advanced scheduling methods and software tools like MS Project and Primavera for project planning and control.	L-3

L1- Remember, L2- Understand, L3- Apply, L4- Analyze, L5- Evaluate, L6- Create

Mapping of CLOs with Pos & PSOs

	Program Outcomes (POs)												Program Specific Outcome s(PSOs)		
Course Learning Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CLO1	M	M							L	L			M		
CLO2	M	H	M		L				M				H	M	
CLO3	H	H	M	L	M				M				H	M	
CLO4	M	H	M	M	M				M		L		H	H	
CLO5	M	M	M	L	H				M				M	H	M

H: High, M: Medium, L: Low