



Gyanmanjari
Innovative University

Course Syllabus
Gyanmanjari Institute of Technology
Semester-2

Subject : Construction Planning and Scheduling - METCP12510

Type of course: Major

Prerequisite: NIL

Rationale: Construction Planning and Scheduling is to ensure projects are executed efficiently, within budget, and on time. Effective planning involves defining the project scope, allocating resources, managing risks, and establishing quality standards. This foundational phase ensures that all aspects of the project are thoroughly considered, reducing the likelihood of unexpected issues. Scheduling, on the other hand, sequences activities and sets timelines to coordinate tasks and resource use efficiently. Techniques like the Critical Path Method (CPM) help identify the most crucial tasks and optimize the project timeline. This structured approach allows for proactive management, enabling adjustments in response to project developments and minimizing delays. Together, planning and scheduling provide a roadmap for project execution, enhance communication among stakeholders, and ensure that all team members are aligned with project goals. This systematic approach ultimately leads to the successful completion of construction projects, meeting client expectations and maintaining industry standards.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks					Total Marks
CI	T	P		C	Theory Marks		Practical Marks		
			ESE		MSE	V	P	ALA	
4	0	2	5	60	30	10	20	30	150

Legends: CI-Class Room Instructions; T – Tutorial; P - Practical; C – Credit; ESE - End Semester Examination; MSE- Mid Semester Examination; V – Viva; CA - Continuous Assessment; ALA- Active Learning Activities.



Course Content:

Sr. No	Course content	Hrs	% Weightage
1	<p>Planning Construction Planning - Organizing, Staffing, directing, and controlling – Factors influence supply and demand of human resources – Role of HR manager – Personnel Principles -case studies</p> <p>Organizing Requirement of Organization – Organization structure – Organization charts – Staffing Plan -Development and Operation of human resources</p>	15	25%
2	<p>Scheduling Techniques: Work Breakdown Structure (WBS) -Time Management and Scheduling -Bar chart and Gantt chart - Network methods - Network diagram - Critical Path Method -Calculation critical path , Floats/slacks - PERT – Three time estimates</p> <p>Resource Techniques Precedence Diagram Method (PDM), Project monitoring - Updating - Target Schedule, Optimum cost and time, Scheduling with uncertain durations-Calculations for Monte Carlo Schedule Simulations-Crashing and Time-Cost Tradeoff</p>	16	25%
3	<p>Project Information Types of Project Information - Accuracy and Use of Information - Computerized Organization and Use of Information - Other Conceptual Models of Databases - Centralized - Database Management Systems - Databases and Applications Programs –Information - Transfer and Flow.</p> <p>Labour and Material Utilization Labour requirements, labour productivity, Equipment, Material Management, Inventory Control, Economic order quantity, EOQ for resource limitation, Resource scheduling - leveling and allocation.</p>	17	30%
4	<p>Cost Estimation Costs Associated with Constructed Facilities - Construction Cost Estimates - Historical Cost Data – Cost Indices - Applications of Cost Indices to Estimating - Estimate based on Engineer's List of Quantities - Estimation of Operating Costs.</p>	12	20%
Total		60	100

Continuous Assessment:

Sr. No	Active Learning Activities	Marks
1	<p>Work Breakdown Structure Development: Students develop a WBS for a hypothetical construction project. They present</p>	10



	their WBS to the class, explaining their rationale for the hierarchical structure and level of detail. And upload on GMIU Web Portal.	
2	Critical Path Method Analysis: Students use the software to create a network diagram for a construction project and identify the critical path. They analyze the critical path activities and discuss strategies for minimizing project duration. And upload on GMIU Web Portal.	10
3	Resource leveling exercise: Students adjust the project schedule to account for resource constraints and optimize resource allocation. They will have to identify potential conflicts and propose solutions to balance workload.	10
Total		30

Suggested Specification table with Marks (Theory):60

Distribution of Theory Marks (Revised Bloom's Taxonomy)						
Level	Remembrance (R)	Understanding (U)	Application (A)	Analyze (N)	Evaluate (E)	Create (C)
Weightage	NA	NA	NA	NA	NA	NA

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcome:

After learning the course, the students should be able to:	
CO1	Understand the importance of construction planning and organizational cultures.
CO2	Discuss the relationship between strategic planning and project planning.
CO3	Construct WBS and compute critical path, slack and floats for a given network diagram.
CO4	Describe the advanced scheduling techniques
CO5	Prepare various types of Project Information using Database Management Systems.
CO6	Create scheduling for material, equipment and manpower requirements to execute the project.

List of Assignment

Assignment and tutorial base on above mention topic.



Instructional Method:

The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.

From the content 10% topics are suggested for flipped mode instruction.

Students will use supplementary resources such as online videos, NPTEL/SWAYAM videos, e-courses, Virtual Laboratory

The internal evaluation will be done on the basis of Active Learning Assignment

Practical/Viva examination will be conducted at the end of semester for evaluation of performance of students in laboratory.

Text Books:

- [1] Prasanna Chandra, (2017), Project Planning, Analysis, Selection, Implementation and Review, 8th Edition, McGraw-Hill, New Delhi.

Reference Books:

- [1] Chitkara, K.K, (2014), Construction Project Management, 3rd Edition, McGraw-Hill Publishing Company, New Delhi.
- [2] Alison Dykstra (2011), Construction Project Management: A Complete Introduction, Kirshner Publishing, San Francisco, USA

