NIRMA UNIVERSITY

Institute:	**School of Engineering, Institute of Technology**
Name of Programme:	**M. Tech. in Civil Engineering (Construction Technology and Management)**
Course Code:	6CL201
Course Title:	Construction Project Planning, Scheduling and Controlling
Course Type:	(☑ Core/ ☐ Value Added Course/ ☐ Departmental Elective/ ☐ Institute Elective/ ☐ University Elective/(☐ Open Elective ☐ Any other)
Year of Introduction:	**2022-23**

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Course Learning Outcomes (CLOs):

At the end of the course, the students will be able to – ☑

1. identify the need of project planning, feasibility study and organisational structure (BL3)
2. choose scheduling techniques to manage construction project (BL5)
3. discover the need of resource allocation and time-cost trade-off (BL4)
4. make use of construction project monitoring & controlling techniques. (BL3)

Syllabus: **Teaching hours: 45**

Unit	**Syllabus**	**Teaching hours**
Unit-I	**Construction Project Planning** Functions of project management, construction projects - Concept, Project Categories, Characteristic of projects, status of construction industry, need of construction management, construction project life cycle, organizational structure: construction company and forms of business organisation, structure of construction organisation, management level, role of various stake holders, construction site management, resource planning: time plan, man power plan, material & equipment plan, project cost plans, client and contractors estimation	12
Unit-II	**Project Scheduling Techniques: CPM and PERT** Introduction to methods of scheduling, work breakdown structure, bar charts, Elements of networks, dummy activity, guidelines for the construction of the network, development of network, Critical path method: start and finish times of activities, floats, float types, estimation of project duration, significance of critical path. Programme evaluation and review technique: concept of uncertainty, expected time of the activity, variability of activity time, earliest expected time and latest allowable occurrence time of event, expected length of critical path, slack, probability of completion of project in given time	12

Unit-III	**Precedence and other Network** Precedence Network: finish to start, finish to finish, start to start and start to finish relationship, concept of lead & lag time, estimation of project duration, critical path, problems of precedence, advantages and disadvantages of precedence network, precedence network for repetitive work, Ladder network, line of balance. Information driven scheduling, resource driven scheduling etc.	08
Unit-IV	**Resource Allocation & Time-Cost Trade-off** Introduction, resource levelling & allocation, other schedules derived from project. Network crashing and time cost trade-off: cost analysis, direct and indirect project costs, total costs, cost slopes, concept of crashing, cost and time optimization.	06
Unit-V	**Project Monitoring and Control** Updating: Monitoring of project, data required for updating, process of updating. Control: Schedule control - monthly progress report, measuring progress at site. Cost control - stage wise cost calculation, S-curve, earned value method. Information Technology in construction – types, accuracy and use of Information, computerized organization, conceptual models of Databases, Database Management Systems.	07

Self Study: The self-study contents will be declared at the commencement of semester. Around 10% of the questions will be asked from self-study contents.

Suggested Readings/ References:

- Popescu, C.M., Charoenngam, C., *Project Planning, Scheduling and Control in Construction: An Encyclopaedia of terms and Applications*, Wiley.
- Chitkara, K.K., *Construction Project Management: Planning, Scheduling and Control*, McGraw-Hill Publishing.
- Hendrickson C., Au, T., *Project Management for Construction - Fundamental Concepts for Owners, Engineers*, Architects and Builders, Prentice Hall.
- Willis, E. M., *Scheduling Construction Projects*, John Wiley & Sons.
- Mubarak, S., Project Scheduling and Control, Wiley
- Jha, K.N., Construction and Project Management, Pearson
- Schexnayder, K., Mayo, F., *Construction Management Fundamentals*, McGraw-Hill Publishing.

Suggested List of Experiments: -

Suggested Case List: -