# GUJARAT TECHNOLOGICAL UNIVERSITY

## ME Civil (Construction Engineering & Management)
## Planning, Scheduling & Control of Construction Projects
## SUBJECT CODE: 3711408

**Type of Course**: Core
**Prerequisite:** NIL

**Teaching and Examination Scheme:**

| Teaching Scheme | | | Credits | Examination Marks | | | | Total Marks |
|---|---|---|---|---|---|---|---|---|
| | | | | Theory Marks | | Practical Marks | | |
| L | T | P | C | ESE | PA(M) | Viva | PA (I) | |
| 3 | 0 | 2 | 4 | 70 | 30 | 30 | 20 | 150 |

**Contents:**

| Sr.No. | Topics | Hrs. | % Weightage |
|---|---|---|---|
| 1 | **Introduction to Construction Projects**: Construction projects & their features, Formal and informal organization, Forms of Project organizations, Requirements of a project organization, Types and selection of organizations, 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.<br>Introduction. | 4 | 11 |
| 2 | **Introduction to Construction Project Planning:**<br>Work Breakdown Structure: Necessity, Methodology and Types. Project planning and scheduling techniques: CPM, PERT & GERT, LOB & LADDER Networks, Precedence Networks, Critical Chain Network. Time & Resource Planning. Management Software. | 6 | 17 |
| 3 | **Project Scheduling & Monitoring using CPM:**<br>AOA and AON Networks, Event time/Activity time calculations, Critical activities and critical paths, Activity floats, Time grid diagrams & resource allocation, Project updating, Time-cost optimization of networks, Cost control and monitoring using CPM networks, Network based Time & Cost variance analysis/Earned Value Analysis, MS PROJECT/PRIMAVERA | 16 | 44 |
| 4 | **Advanced Networks and Scheduling Concepts/Tools**:<br>PERT Network Analysis, Precedence Network Analysis, Line of Balance Methods | 6 | 17 |

| | | | |
|---|---|---|---|
| 5 | **Project Quality Control:** Introduction. Construction Quality Control: QA-QC Model, Quality Assurance: TQM, ISO Standards, CONQUAS and AUDIT. Cost of Quality. Quality policy, Objectives and methods in construction industry, Factors Influencing Construction Quality, Construction Productivity | 4 | 11 |
| | **Total** | **36** | **100** |

**Reference Book(s)**


1. Sharma, M.R., Fundamnetals 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.


**Course Outcome**

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.

**List of Tutorials**

1. Work breakdown structure (WBS)
2. Development of Activity logical Relations
3. Bar charts
4. CPM network developments (AOA & AON)
5. CPM network analysis (Event times/activity times/floats)
6. Project updating
7. Project crashing (time-cost optimization)
8. Time-grid diagrams & resource allocation/resource histogram
9. Earned value analysis
10. PERT network analysis
11. PD network analysis
12. Line of Balance Method (LOB)
13. Software Based Project (To be issued at the beginning and to be developed throughout)

**List of Open Source Software/learning website:** **www.nptel.iitm.ac.in/courses/**