

GUJARAT TECHNOLOGICAL UNIVERSITY

BRANCH NAME: CIVIL ENGINEERING
SUBJECT NAME: CONSTRUCTION MANAGEMENT
SUBJECT CODE: 2180611
B.E. 8th SEMESTER

Type of course: Core subject

Prerequisite: Study of construction & construction equipments

Rationale: Skill of management of Construction works is highly required by the students of civil Engineering.

Teaching and Examination Scheme:

Teaching Scheme			Credits C	Examination Marks						Total Marks
L	T	P		Theory Marks			Practical Marks			
			ESE (E)	PA (M)		ESE (V)		PA (I)		
				PA	ALA	ESE	OEP			
3	2	-	5	70	20	10	30	0	20	150

Content:

Sr. No.	Content	Total Hrs	% Weightage
1	Introduction: A construction project, Phases of construction project, Importance of construction and construction industry, Indian construction industry need of construction management, Stakeholders of construction management.	3	5
2	Project organization: Construction company structure of construction organization, Organizing for construction project management, Management levels, Traits of project manager and co-ordinators. Ethical conduct for engineers, Factors for success of a construction organization.	2	5
3	Construction economics: Economic decision making, Evaluating alternatives by , Effect of taxation on comparison of alternatives, Effect of inflation on cash flow, Evaluation of public projects, Benefit cost ratio method.	4	10
4	Construction planning: Types of project plans, Work break down structure, Planning techniques, Bar charts, CPM and PERT network analysis, Precedence network ladder network, Line of balance method.	4	10
5	Project scheduling and Resource leveling, Resource allocation, Importance of project scheduling, Deriving other schedules, Network crashing and cost time trade off.	4	10
6	Construction equipment management advanced concepts in economical analysis.	3	5
7	Construction accounts management Principles of accounting, Accounting process construction contract revenue recognition, Construction contract status report, Limitation of accounting, Balance sheet, Profit and loss account, Working capital, Ratio analysis, Fund flow statement.	4	10
8	Construction material management: Material management functions, Inventory management. Job layout	2	5

9	Construction project cost and cost and value managements – Project cost management, Collection of cost related information, Cost codes, Cost statement, Value management in construction, Steps, Value engineering application in a typical case project.	4	10
10	Construction quality management: Construction quality, Inspection, Quality control and Quality assurance in projects, Total quality management, Quality gurus and their teaching cost of quality ISO standards, Principles of quality management systems, (CONQUAS) construction quality assessment system.	4	10
11	Construction safety management, Evolution of safety, Accident causation theory, Unsafe conditions, Unsafe acts health and safety act and regulation cost of accidents, Role of safety personnel, Accident causes and principles of safety, Safety and health management system.	2	5
12	Linear programming in construction management: Formulation of model, Graphical and Simplex method.	2	5
13	Factors for success of a construction project: Project performance measurement and project evaluation criteria, Project performance attributes, Effect of other elements on project performance	4	10

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom’s Taxonomy)

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.

Reference Books:

- 1) Construction project management: Theory and Practices, 2nd edition, 2016, Kumar Niraj Jha, Pearson Education Publishers.
- 2) Project management for engineering and Construction, By Garold D Oberlender, 2nd Edition, McGraw Hill Education (India), Pvt. Ltd.
- 3) CPM and PERT: Punamia & Khandelwal.
- 4) Construction planning and management, P S Gehlot and B M Dhir, Wiley Eastern Ltd.
- 5) A management guide to PERT/ CPM by Weist and Levy, Prentice Hall
- 6) Construction management, P P Dharwadkar.
- 7) Construction of Structures and Management of Works, S. C. Rangwala, Charotar Publications.

Course Outcome:

After learning the course the students should be able to:

- (1) Execute all type of managerial tasks in construction projects.
- (2) Use software for construction projects management.

List of Experiments: Students shall solve the examples based on syllabus and learn the application of any software out of Primavera, Project kick start, MS Project, Milestone professional, AMS real time, Candy, etc.

Design based Problems (DP)/Open Ended Problem:

1. Students may visit a construction project site and study various management practices and find out the progress is as per planning or not. If not what are the factors responsible for discrepancy. (Techno Managerial auditing of project)
2. Students may launch a trial project of housing and perform all functions to be at planning stage.
3. Students can select any construction project and work out Benefit Cost ratio.
4. Student can carry out techno-managerial auditing of specific construction projects like, Bridge Highways, Canals, Dams.
5. Students shall adopt any construction project and study how the management tasks are performed and how the progress is monitored. Students shall submit a report of their case study.
6. Teacher can give data of a construction project and students can be asked to carry out all function required during the planning phase.
7. Any other topic the teacher deems fit as the OEP.

Major Equipment: A computer system supporting Primavera, Revit, MS Project.

A site visit of heavy construction project should be arranged to show the working of construction equipments like dragline, bull dozers, clamshell, belt conveyors, scrappers, compactors, etc.

List of Open Source Software/learning website:

nptel.ac.in/

ACTIVE LEARNING ASSIGNMENTS: Preparation of power-point slides, which include videos, animations, pictures, graphics for better understanding theory and practical work – The faculty will allocate chapters/ parts of chapters to groups of students so that the entire syllabus to be covered. The power-point slides should be put up on the web-site of the College/ Institute, along with the names of the students of the group, the name of the faculty, Department and College on the first slide. The best three works should submit to GTU.