

4/4 B.Tech. EIGHTH SEMESTER

CE8T1 CONSTRUCTION TECHNOLOGY AND PROJECT MANAGEMENT Credits: 3
Lecture: 3 periods/week Internal assessment: 30 marks
Tutorial: 1 period /week Semester end examination: 70 marks

Pre-requisites: Building planning and drawing, estimation and costing

Learning objectives:

- To get introduction to concepts of projects formulation.
- To learn project planning and scheduling of activities.
- To gain knowledge of concepts of resource planning and allocation and control.
- To gain a bird's eye view of optimization techniques.

Course outcomes:

At the end of course the student will have:

1. Knowledge on different methods of Planning and scheduling
2. A complete idea on developing networks using PERT and CPM methods.
3. Knowledge on resource management of manpower and materials.
4. Knowledge in the usage of construction machinery.
5. An idea on various concepts of quality control and safety management

UNIT – I

INTRODUCTION

Construction projects; Project management; Main causes of project failure.

PLANNING

Steps involved in planning; Objectives; Principles; Advantages; Limitations; Stages of planning.

SCHEDULING

Scheduling, Preparation of construction schedules; Methods of scheduling; Bar charts; Mile stone charts; Controlling; Job layout; Factors affecting job layout; Project work break down; Activities involved; Assessing activity duration.

UNIT – II

PROJECT MANAGEMENT THROUGH NETWORKS

Objectives of network techniques; Fundamentals of network analysis; Events; Activities; Dummies; Types of networks; Choice of network type; Advantages of network techniques over conventional techniques.

PROGRAM EVALUATION AND REVIEW TECHNIQUE (PERT)

Introduction; Time estimates; Earliest expected time; Latest allowable occurrence time; Slack; Critical path; Probability of completion time for a project.

CRITICAL PATH METHOD (CPM)

Introduction; Difference between CPM and PERT; Earliest event time; Latest event time; Activity time; Float; Critical activities and critical path.

UNIT – III

COST CONTROL

Direct cost; indirect cost; Total project cost; Optimization of cost through networks; Steps involved in optimization of cost.

RESOURCE MANAGEMENT (MANPOWER)

Introduction; Resource smoothing; Resource leveling; establishing workers productivity.

RESOURCE MANAGEMENT (MATERIALS)

Objectives of material management; Costs; Functions of material management department; ABC classification of materials; Inventory of materials; Material procurement; Stores management.

UNIT – IV

RESOURCE MANAGEMENT (MACHINERY)

Classification of construction equipment; Earth moving equipment; Excavation equipment; Hauling equipment, Earth compaction equipment; Hoisting equipment; Concreting plant and equipment; Time and motion study; Selection of equipment– Task consideration, Cost consideration; Factors affecting the selection; Factors affecting cost owning and operating the equipment; Equipment maintenance.

CONSTRUCTION TECHNIQUES

Evaluation and selection of equipment and methods for construction of projects including earthmoving, paving, steel and concrete construction, form work and trenching,

UNIT – V

QUALITY CONTROL

Importance of quality; Elements of quality; Organization for quality control; Quality assurance techniques; Documentation; Quality control circles; Total quality management; ISO – 9000.

SAFETY MANAGEMENT

Accident prevention programme; Immediate attention in case of accident; Approaches to improve safety in construction; Safety benefits to employers, employees and customers; Prevention of fires in construction industries; Safety information system; Safety budgeting.

Learning resources:

Text books:

1. Construction Engineering and Management by Dr. Seetharaman S., Umesh Publications, Nai Sarak, Delhi, 2000.
2. Fundamentals of PERT/CPM and Project Management, (1st edition) by Bhattacharjee S.K., Khanna Publishers, Nai Sarak Delhi, 2011.

Reference books:

1. Construction Management & Planning by Sengupta,B. and Guha H., Tata McGraw – Hill, New Delhi, 1995.
2. Construction Planning, Equipment & Methods by Peurifoy R.L., McGraw – Hill International Book Company, 2006.
3. PERT & CPM Principles and applications by Srinath,L.S. Affiliated East West Press, 1971.

e-learning resources:

NPTEL