



# INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal - 500 043, Hyderabad, Telangana

## COURSE CONTENT

CONSTRUCTION SCHEDULING								
VI Semester: CE								
Course Code	Category	Hours/Week			Credits	Maximum Marks		
ACED30	Elective	L	T	P	C	CIA	SEE	Total
		3	0	0	3	40	60	100
Contact Classes: 48	Tutorial Classes: Nil	Practical Classes: Nil			Total Classes: 48			
Prerequisite: Building Materials-Construction Planning								

### I. COURSE OVERVIEW:

Construction Scheduling deals with project scheduling techniques and procedures including how to create a network diagram, how to define the importance of the critical path in a project network and defining project activities float. Also covered are the fundamentals of Bar Charts, Precedence Diagrams, Activity on Arrow, PERT, Range Estimating, and linear project operations and the line of balance.

### II. COURSE OBJECTIVES:

#### The student will try to learn:

- I. The construction scheduling, management practices and technologies in the construction industry.
- II. The construction activity relationships and scheduling tools various types of planning tools like bar chart, CPM networks.
- III. The bar charts and critical path method networks for construction activities
- IV. The appropriate mastery of the knowledge, techniques, skills and modern tools of construction scheduling

### III. COURSE OUTCOMES:

At the end of the course students should be able to:

- |      |   |
|------|---|
| CO 1 | Explain various management Principles for Planning, decision making and improve the leadership qualities.                                 |
| CO 2 | Apply CPM and PERT techniques for detailed construction planning and execution of various projects.                                       |
| CO 3 | Illustrate the planning and organization at site layout for controlling manpower, inventory and procurement.                              |
| CO 4 | Apply line of balance of techniques for Resource aggregation and allocation   |
| CO 5 | Make use of labour material and equipment controlling in project management for Controlling Quality and safety of constructed structures. |
| CO 6 | Explain The various cost involved in construction projects for preparing proper contracts and tender documents.                           |

#### **IV. COURSE CONTENT:**

##### **MODULE –I: CONSTRUCTION PLANNING (10)**

Basic concepts in the development of construction plans, Choice of Technology and Construction method-Defining Work Tasks, Work breakdown structure, Definition, Precedence relationships among activities, Estimating Activity Durations, Estimating Resource Requirements for work activities, coding systems.

##### **MODULE -II: SCHEDULING PROCEDURES AND TECHNIQUES (10)**

Relevance of construction schedules, Bar charts, The critical path method, Calculations for critical path scheduling-Activity float and schedules, Presenting project schedules-Critical path scheduling for Activity-on-node and with leads, Lags and Windows-Calculations for scheduling with leads, lags and windows, Resource oriented scheduling, Scheduling with resource constraints and precedences, Use of Advanced Scheduling Techniques, Scheduling with uncertain durations-Crashing and time/cost tradeoffs, Improving the Scheduling process

##### **MODULE -III: COST ANALYSIS (10)**

Cost analysis - direct cost, indirect costs, and slope of the project activities, optimization of cost schedule through network contraction, applications in construction industry.

##### **MODULE -IV: COST CONTROL (9)**

Cost control in construction projects, importance of cost control and its objectives, resource analysis, smoothing and leveling of various construction projects.

##### **MODULE –V: PRECEDENCE NETWORK (9)**

Precedence network, advantages of precedence network, logic of precedence network diagram, and computer applications on network problems related to construction industry.

#### **V. TEXTBOOKS:**

1. Chitkara, K K., “*Construction Project Management Planning, scheduling and control*”. Tata McGraw Hill Publishing Co, Ltd., New Delhi, 2005.
2. Srinath, L.S., “*Pert and CPM Principles and Applications* “, Affiliated East West Press, 2001.

#### **VI. REFERENCE BOOKS:**

1. Chris Hendrickson and Tung Au, “*Project Management for Construction –Fundamentals Concepts for Owners*”, Engineers, Architects and Builders, Prentice Hall, Pittsburgh, 2000.
2. Moder, J., C. Phillips and Davis, “*Project Management with CPM*”, PERT and Precedence Diagramming, Van Nostrand Reinhold Co., 3<sup>rd</sup> Edition, 1983.
3. Willis, E.M., “*Scheduling Construction projects*”, John Wiley and Sons 1986.
4. Halpin, D.W., “*Financial and cost concepts for construction Management*”, John Wiley and Sons, New York, 1985.

#### **VII. ELECTRONICS RESOURCES:**

1. <https://www.scribd.com/doc/231678531/k-k-Chitkara-Construction-Project-Management>
2. [http://www.opentextbooks.org.hk/system/files/export/15/15694/pdf/Project\\_Management.pdf](http://www.opentextbooks.org.hk/system/files/export/15/15694/pdf/Project_Management.pdf)

#### **VIII. MATERIAL ONLINE:**

1. Course template
2. Tech-talk topics
3. Assignments
4. Definition and terminology
5. Tutorial question bank
6. Model question paper – I
7. Model question paper – II
8. Lecture notes
9. Early lecture readiness videos (ELRV)
10. Power point presentations