Program : **Diploma in Architecture / Civil Engineering**	
Course Code : **5011**	Course Title: **Construction Management and Safety Engineering**
Semester : **5**	Credits: **No Credit**
Course Category: **Common Course**	
Periods per week: **4 (L:3, T:1, P:0)**	Periods per semester: **60**

Course Objectives:

- To understand the contract management and associated labour laws.
- To prepare and understand the principle involved in site layout.
- To know the procedure for scheduling of various activates in construction project.
- To familiarize with labour laws, procedure for arbitration, settlements.
- To know different safety measures in construction projects.

Course Pre-requisites:

Topic	Course code	Course name	Semester
Stages of Construction		Building construction and construction materials	3

Course Outcomes:

On completion of the course, the student will be able to:

COn	Description	Duration (Hours)	Cognitive Level
CO1	Identify principles involved in construction management and procedures for land acquisition	15	Understanding
CO2	Apply the project management tools and schedule the network model.	14	Applying
CO3	Describe contract management and construction equipment	15	Understanding
CO4	Describe safety measures at construction projects	14	Understanding
	Series Test	2	

CO - PO Mapping:

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1						3	
CO2						3	
CO3						3	
CO4	3						

3-Strongly mapped, 2-Moderately mapped, 1-Weakly mapped

Course Outline:

On completion of the course student will be able to:

Module outcomes	Description	Duration (Hours)	Cognitive Level
CO1	**Identify principles involved in construction management and procedures for land acquisition**		
M1.01	Identify the principles of management and list the various types of organization	3	Remembering
M1.02	Discuss the role of consultant for various activities	3	Understanding
M1.03	Explain thepreparation of site layout	4	Understanding
M1.04	Describe Land acquisition procedures and providing compensation	5	Understanding
Contents: Construction Management-Principles of Management Organization-objectives, principles of organization, types of organization: government/public and private construction industry, Role of various personnel in construction organization. Agencies associated with construction work- owner, promoter, builder, designer, architects. Role of consultant for various activities: Preparation of Detailed Project Report (DPR), monitoring of progress and quality, settlement of disputes. Principles governing site layout. Factors affecting site layout. Preparation of site layout. Land acquisition procedures and providing compensation			
CO2	**Describe the project management tools and schedule the network model**		
M2.01	Use bar charts to show the activities in a construction work	3	Applying

M2.02	Identify the terms related with network for the given construction project	3	Understanding
M2.03	Schedule network for the given construction project	4	Applying
M2.04	Describe material management.	4	Understanding
	Series Test - I	1	

Contents:

Identifying broad activities in construction work & allotting timeperiod to it, Methods of Scheduling, Development of bar charts, Merits & limitations of bar chart.

Elements of Network: Event, activity, dummy activities, Precautions in drawing Network, Numbering the events.

CPM networks, activity time estimate, start and finish time of activity, project duration. Floats: Types of Floats-Free, independent and total floats, critical activities and critical path. Outline PERT networks

Purpose of crashing a network, Normal Time and Cost, Crash Time and Cost, Cost slope, Optimization of cost and duration.

Introduction to BIM- Management Software

Material Management- Ordering cost, inventory carrying cost, Economic Order Quantity

Store management, various records related to store management, inventory control by ABC,VED technique, Introduction to material procurement through portals (e.g., www.inampro.nic.in)

CO3	**Describe contract management and construction equipment**		
M3.01	Describe tender procedure	4	Understanding
M3.02	List out the type of contracts	3	Remembering
M3.03	Identify contract documents	4	Understanding
M3.04	Explain how to choose appropriate modern equipment used in construction projects	4	Understanding

Contents:

Define tender and tender procedure -EMD, Security Deposit, Procedure for e-tender

Types of Construction contracts

Contract documents, specifications, general and special conditions

Contract Management, procedures involved in arbitration and settlement (Introduction only)

Identify different modern equipment used in construction projects. -bull dozer, angle dozer, excavator, power shovel, forklift, tower crane, back hoe, back hoe loader, gantry crane, slip form paver, grader, TBM etc. State the specific use of various construction equipment.

Identify the factors related to selection of equipment.

CO4	**Describe safety measures at construction projects**		
M4.01	List out the causes of accidents in project site	3	Remembering
M4.02	Describe the role of supervisor/ Engineer in ensuring safety at construction site	4	Understanding
M4.03	Explain how to take precautions in handling hazardous material	3	Understanding
M4.04	Describe Labour Laws and Acts	4	Understanding
	Series Test - II	1	

Contents:

Construction safety: Basic principles of safety - Major causes of accidents at project site - Effects of accidents - Safety practices at construction site - Excavation, Working at Heights, Fire, Underwater, Marshlands etc.- Precautions in handling hazardous materials - Occupational hazard - Role of supervisor/ Engineer in ensuring safety at construction site -

Labour Laws and Acts pertaining to Civil construction activities (Introduction)

Text / Reference:

T/R	Book Title/Author
T1	Sharma S C and Deodhar S V, Construction Engineering and Management, Khanna Book Publishing, New Delhi
R1	Gahlot,P.S. and Dhir, B.M Construction planning and managemen New Age International (P) Ltd. Publishers, New Delhi.
R2	Shrivastava, U.K., Construction planning and management, Galgotia Publication Pvt Ltd. New Delhi
R3	Mantri, S., The A to Z of Practical Building Construction and its Management, Satya Prakashan New Delhi
R4	Khanna, O.P., Industrial Engineering and management, Dhanpat Rai New Delhi
R5	Punmia, B.C. and Khandelwal, K.K., Project Planning and Controlling with PERT and CPM,
R6	Sengupta, B., Guha H., Construction Management and Planning, Tata-McGrawHill
R7	Harpal, Singh, Construction Management and accounts, Mc-Graw Hill.
R8	Sharma, S.C., Industrial Engineering and Management, Khanna Publications, New Delhi

Online Resources:

Sl.No	Website Link
1	www.inampro.nic.in
2	https://www.mindtools.com/pages/article/critical-path-analysis.htm
3	https://etenders.kerala.gov.in/nicgep/app
4	https://theconstructor.org/construction/heavy-construction-equipment-types/26305/
5	https://ehs.princeton.edu/workplace-construction/construction-safety