

Branch Name:	Civil Engineering
Semester/Year:	Semester VI / Third Year
Subject Title:	Advance Construction Technology & Management
Subject Code:	1ET1060602
Pre-requisite:	Basic knowledge of Building Construction and Materials.

Course Objective:

- To give an experience in the implementation of new technology concepts which are applied in field of advanced construction
- To study different methods of construction to successfully achieve the structural design with recommended specifications.
- To involve the application of scientific and technological principles of planning, analysis, design and management to construction technology.
- To study of construction equipments, and temporary works required to facilitate the construction process
- To make the students aware of the method of construction management.
- To impart knowledge about different methods of network planning.

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
Lecture (L)	Tutorial (T)	Practical (P)	Credit	Theory (Marks)		Practical (Marks)		Total (Marks)
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
03	01	00	04	70	30	-	-	100

Subject Contents			
Sr. No	Topic	Total Hours	Weightage (%)
1	<u>Caissons:</u> Definition, uses, construction material, types of caissons, loads on caisson, design features of caissons, floating of caissons, cutting edges, sinking of caisson, tilting of caisson, shifting of caisson, caisson diseases	03	10
2	<u>Diaphragm wall construction:</u> Introduction, uses, site selection criteria <u>Coffer Dams:</u> Definition, uses, selection of coffer dams, types of coffer dams, design features of coffer dams, leakage prevention, economic height <u>Control of Ground water in Excavations:</u> Methods-pumping, well points, bore wells, electro-osmosis, injections with cement, clays and chemical, freezing process, vibro- flotation.	01 01 01	10

3	<u>Form work:</u> Form work for R.C.C. Wall, slab, beam and column, centering for arches of large spans and dams, design features for temporary works, slip formwork, False work for Bridges <u>Construction of tall structures & Demolition of Structure:</u> Materials of tall structures. Structural system for tall structures. Methods of construction of tall structures. Demolition, taking down, dismantling, methods, safety	03 02	10
4	<u>Construction Equipment:</u> Mechanization in Construction: Importance of construction equipments their classification, selection and contribution rate of production (Output), Owning and operating cost. Engineering fundamentals: Related to performance of IC engines, rimpull, drawbar pulls, Coefficient of traction, Gradability.	01 02	10
5	<u>Excavating equipments :</u> Selection, basic parts, operation, factors affecting output Tractors and related equipment: Bulldozers, Rippers, Scrapers Excavating Equipment: Power shovels, Draglines, Hoes, Clam shells and trenching machines <u>Hauling and conveying equipments :</u> Belt conveyor system: Terminology, Classification, Components, Power requirement estimation and design. Hauling and lifting equipment: Trucks, wagons, cranes etc. Pile boring / driving equipment Concrete Batching plant Tunnel Boring machines	04 05	10 10
6	<u>Introduction of construction management:</u> A construction project, Phases of construction project, Importance of construction and construction industry, Indian construction industry need of construction management, Stakeholders of construction management <u>Project organization:</u> 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.	02 02	10
7	<u>Construction economics:</u> 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 <u>Construction planning:</u> 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. <u>Project scheduling and Resource leveling:</u> Resource allocation, Importance of project scheduling, Deriving other schedules, Network crashing and cost time trade off.	04 04 03	10 10 05
8	<u>Construction equipment management</u> advanced concepts in economical analysis.	01	05

	<u>Construction material management:</u> Material management functions, Inventory management. Job layout	01	
	<u>Construction safety management:</u> 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.	02	

Course Outcome:

After learning the course the students should be able to:

1. Supervise the heavy construction sites.
2. Understand the working principle and use of various equipments
3. Select appropriate construction equipments for desired construction works.
4. Execute the operations of Demolition of structures with safety.
5. Erect the false work for Bridges and form work for Heavy structures
6. Execute all type of managerial tasks in construction projects.

Reference Books:

1. Building Construction by B.C.Punamia
2. Building Construction by S.C.Rangwala
3. Building Construction by Gurucharan Singh
4. Heavy Construction by Vazirani & Chandola
5. Construction, Planning, Equipment and Methods by R.L.Peurifoy
6. Building Construction By Dr. Jha & S.K. Sinha
7. Construction Engineering and Management By S.Seetharaman
8. Construction Equipment and Its Management By S C Sharma
9. Construction Equipment By Jagdish Lal
10. CPM and PERT: Punamia & Khandelwal.
11. Construction planning and management, P S Gehlot and B M Dhir, Wiley Eastern Ltd.
12. A management guide to PERT/ CPM by Weist and Levy, Prentice Hall
13. Construction management, P P Dharwadkar.
14. Construction of Structures and Management of Works, S. C. Rangwala, Charotar Publications
15. Project management for engineering and Construction, By Garold D Oberlender, 2nd Edition, McGraw Hill Education (India), Pvt. Ltd.

E-Resources :

<http://nptel.ac.in/>

<http://www.equipmentworld.com/>

www.constructionequipment.com