

INSTITUTE	DIPLOMA STUDIES
PROGRAM	DIPLOMA ENGINEERING (CIVIL ENGINEERING)
SEMESTER	5
COURSE TITLE	ADVANCED CONSTRUCTION TECHNOLOGY
COURSE CODE	09CI2506
COURSE CREDITS	3

Objective:

- 1 To know different methods in concreting
- 2 To gain knowledge on different materials in advanced construction
- 3 To know different methods in concreting.
- 4 To know the relevance of advanced construction methods for particular site condition.
- 5 To identify the requisite hoisting and conveying machinery for the given situation

Course Outcomes: After completion of this course, student will be able to:

- 1 Use relevant materials in advanced construction of structures.
- 2 Use relevant method of concreting and equipment according to type of construction.
- 3 Apply advanced construction methods for given site condition.
- 4 Select suitable hoisting and conveying equipment for a given situation.
- 5 Identify advanced equipment required for a particular site condition

Pre-requisite of course: no pre requisite knowledge required

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
2	0	2	50	30	20	25	25

Contents : Unit	Topics	Contact Hours
1	Advanced Construction Materials Fibres: Use and properties of steel, polypropylene, carbon and glass fibres., Plastics: Use and properties of PVC, RPVC, HDPE, FRP, GRP., Miscellaneous Materials: Properties and uses of acoustics materials, wall claddings, plaster boards, micro-silica, waterproofing materials, adhesives	4

Contents : Unit	Topics	Contact Hours
2	Advanced Concreting Methods and Equipments. Ready Mix Concrete: Necessity and use of ready mix concrete. Products and equipments for ready mix concrete plant. Conveying of ready mix concrete, transit mixers, Underwater Concreting: Procedure and equipments required for Tremie method, Drop bucket method., Special concrete: procedure and uses of special concretes: Roller compacted concrete, Steel Fibre reinforced concrete, Foam concrete, shotcreting	7
3	Advanced Technology in Constructions Construction of bridges and flyovers: Equipments and machineries required for foundation and super structure., Construction of multi-storeyed Building: Equipments and machinery required for construction of multi-storeyed building such as use of lifts, belt conveyers, pumping of concrete., Prefabricated construction: Methods of prefabrication, Plant fabrication and site fabrication, All prefabricated building elements such as wall panels, slab panels, beams, columns, door and window frames etc. Equipments and machineries used for placing and Jointing of prefabricated elements	6
4	Hoisting and Conveying Equipments Hoisting Equipments: Principles and working of Derrick-Pole, Gin Pole, Crane, Power driven scotch derrick crane, Hand operated crane, Locomotive crane, Tower crane, Lattice Girder, Winches, Elevators, ladders. Crawler cranes, Truck mounted cranes, Gantry cranes, Mast cranes., Conveying Equipments: Working of belt conveyers, types of belts and conveying mechanism. Capacity and use of dumpers, tractors and trucks.	6
5	Miscellaneous Machineries and Equipments Excavation Equipments: Use, working and output of following machinery – bull dozers, scrapers, graders, Clam Shell, trenching equipment, Tunnel boring machine, Wheel mounted belt loaders, power shovels, JCB, and drag lines, Miscellaneous Equipments: Working and selection of equipments: Pile driving equipments, Pile hammers, Hot mix bitumen plant, bitumen paver, grouting equipment, guniting equipments, floor polishing and cutting machine selection of drilling pattern for blasting, Ben- tonite/mud slurry in drilling, Explosives for blasting, Dynamite, process of using explosives.	5
Total Hours		28

Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
1	Assignment 1 a) Earthmoving machineries b) Equipment for excavation c) Handling equipment d) Hoisting equipment e) Conveying equipments.	4

Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
2	Assignment 2 Different types of shallow and deep foundations	2
3	Assignment 3 Different types of pile foundations	2
4	Assignment 4 Dewatering methods	2
5	Assignment 5 Different types of coffer dams	2
6	Assignment 6 Different types of caisson	2
7	Assignment 7 Slip form work	2
8	Assignment 8 Prepare a site visit report regarding your visit in which construction work is going on with advanced equipment's stating list of equipment including its selection criteria and its advantages	4
9	Assignment 9 Topic of Seminar shall be given to a group of students. The students are required to submit and present / defend the Seminar in presence of students and teachers and report including PowerPoint presentation to be attached with submission. Each individual student's contribution in group work need to be made explicit.	4
10	Assignment 10 Based on advanced construction technology curriculum, on any one related topic narrating the case with specific operations/ problems faced/resolved from nearby construction work area with short details.	4
Total Hours		28

Textbook :

- 1 Building construction, B.C. Punmia, Laxmi Publication, New Delhi, 2021
- 2 Building Construction and Materials, S.C. Rangwala, Charotar Publishing House, 2018

References:

- 1 Building construction, Building construction, S.P. Arora and S.P. Bindra, Dhanpat Rai, 2018
- 2 Repair & Rehabilitation of Structures, Repair & Rehabilitation of Structures, B.G. Deshpande & S.K. Pallearwar, Wheeler Publishing Co. Ltd., 2016

Suggested Theory Distribution:

The suggested theory distribution as per Bloom's taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery

Remember / Knowledge	Understand	Apply	Analyze	Evaluate	Higher order Thinking / Creative
20.00	30.00	30.00	0.00	0.00	0.00

Instructional Method:

- 1 The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.
- 2 The internal evaluation will be done on the basis of continuous evaluation of students in the laboratory and class-room.
- 3 Practical examination will be conducted at the end of semester for evaluation of performance of students in laboratory
- 4 Students will use supplementary resources such as online videos ,videos ,e-courses,Virtua lLaboratory

Supplementary Resources:

- 1 <http://www.nptel.iitm.ac.in/>