INSTITUTE	**DIPLOMA STUDIES**
PROGRAM	**DIPLOMA ENGINEERING (CIVIL ENGINEERING)**
SEMESTER	**3**
COURSE TITLE	**CONSTRUCTION TECHNOLOGY**
COURSE CODE	**09CI3304**
COURSE CREDITS	**3**

Objective:

1 To identify different components of building.
2 To understand different types of foundation and their significance.
3 To know different types of masonry and their construction.
4 To highlight the importance of construction equipments

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

1 Apply suitable building components and construction methods for substructure and superstructure based on functional requirements of buildings as per National Building Code of India 2016 classification.
2 Select and apply appropriate types of foundations (shallow and deep) for given soil conditions and loading scenarios in practical construction situations.
3 Analyze different building components (foundation, walls, floors, roofs, beams, columns, etc.) and construction systems (load bearing, framed, composite) based on strength, stability, and performance.
4 Analyze various masonry techniques (stone and brick masonry), bonds, and construction practices to determine their suitability, advantages, and limitations in real projects.
5 Evaluate the selection and performance of construction equipment (earthmoving, compacting, hoisting) and construction practices (formwork, scaffolding) based on efficiency, safety, and project requirements.

Pre-requisite of course:NOT 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

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Contents : Unit	Topics	Contact Hours
1	**Overview of Building Components** Classification of Buildings as per latest National Building Code Group A to I, Building classification as per Types of Constructions- Load Bearing Structure, Framed Structure, Composite Structure, Building Components :Functions of Building Components, Substructure – Foundation and Plinth, Superstructure – Walls, Partition wall, Cavity wall, Sill, Lintel, Doors and Windows, Floor, Roof, Columns, Beams, and Parapet	8
2	**Construction of Substructure: Foundation** Types of foundation and its functions, , Shallow Foundation: Stepped Footing, Wall Footing, Column Footing, Shallow Foundation: Stepped Footing, Wall Footing, Column Footing, Deep Foundation - Pile Foundation, Well foundation and Caissons	6
3	**Construction of Superstructure** Stone Masonry: Terms used in stone masonry- facing, backing, hearting, Through stone,corner stone, cornice, Types of stone masonry: Rubble masonry, Ashlar Masonry, and their types, Terms used in brick masonry- header, stretcher, closer, quoins, course, face, back, hearting, bat bond, joints, lap, frog line, level and plumb, Bonds in brick masonry- header bond, stretcher bond, English bond, and Flemish bond, Requirements of good brick masonry, Comparison between stone and brick Masonry, Toolsrequired for construction of stone and brick masonry,, Precautions to be observed in stone and brick masonry, masonryconstruction, Purpose and types of formworks, removal of formwork, Purpose and types of Scaffolding	8
4	**Construction Machineries and Equipment** Excavationand Earth moving equipments: Use and working of Power shovel, Drag line, Hoes, Clam shell, Trenching Machines, Tractors, Bull-dozer, Rippers, and Scrapers, Compacting equipments: functions of plain rollers, ship footed rollers, vibratory, and pneumatic rollers,, Hoisting equipments: Types of cranes – mobile crane, tower crane and gantry girder	6
Total Hours		**28**

Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
1	**Experiment 1** Draw sketches of load bearing structure and framed structure and identify their components.	2
2	**Experiment 2** Draw sketches of shallow foundations such as stepped footing, wall footing and isolated column footing.	2
3	**Experiment 3** Draw sketches of shallow foundations such as combined footing, raft foundation and grillage foundation.	2

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Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
4	**Experiment 4** Draw sketches of deep foundations such as pile foundation, well foundation and caisson.	2
5	**Experiment 5** Draw sketches of types of stone masonry such as rubble masonry and ashlar masonry.	2
6	**Experiment 6** Draw sketches of bonds in brick masonry such as header bond, stretcher bond, English bond and Flemish bond.	2
7	**Experiment 7** Draw sketches of various brick walls using different brick dimensions and thicknesses.	2
8	**Experiment 8** Draw sketches of tools required for construction of stone masonry and brick masonry.	2
9	**Experiment 9** Draw sketches of different types of formwork used in construction.	2
10	**Experiment 10** Draw sketches of different types of scaffolding used in construction.	2
11	**Experiment 11** Draw sketches of excavation and earth moving equipment used in construction.	2
12	**Experiment 12** Draw sketches of compacting equipment used in construction.	2
13	**Experiment 13** Draw sketches of hoisting equipment used in construction.	2
14	**Experiment 14** Prepare a report on safety measures and recent trends in the construction field.	2
Total Hours		**28**

Textbook :

1 Building Construction, Dr.B.C.Punmia, Er. Ashok Kumar Jain and Dr. Arun Kumar Jain, Laxmi publications, 2019

2 Building Construction and Materials, S.C. Rangwala, Charotar Publishing House, 2022

References:

1 Repair & Rehabilitation of Structures, Repair & Rehabilitation of Structures, , B.G. Deshpande & S.K. Pallewar, Wheeler Publishing Co. Ltd, 2016

2 Green Building Materials and Technologies, Green Building Materials and Technologies, Poonam Choudhary, New Age International Publishers, 2019

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 and evaluation					
Remember / Knowledge	**Understand**	**Apply**	**Analyze**	**Evaluate**	**Higher order Thinking / Creative**
40.00	40.00	20.00	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 o the semester for an evaluation of the performance of students in the laboratory
4. Students will use supplementary resources such as videos e -courses, Virtual Laboratory

Supplementary Resources:

1. https://nptel.ac.in/courses/105102088
2. https://theconstructor.org/
3. https://www.cecr.in

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