



# GUJARAT TECHNOLOGICAL UNIVERSITY

**Bachelor of Engineering**

**Subject Code: 3130607**

**Semester – III**

**Subject Name: Building Construction Technology**

**Type of course:** Civil Engineering

**Prerequisite:** Introduction to Civil Engineering Structures, Construction Materials

**Rationale:** The development of a basic understanding about the construction of different type of Structures and application of the basic principles of Engineering to solve real life problems in construction practices is necessary for civil engineers.

**Teaching and Examination Scheme:**

Teaching Scheme			Credits C	Examination Marks				Total Marks
L	T	P		Theory Marks		Practical Marks		
				ESE (E)	PA (M)	ESE (V)	PA (I)	
4	0	2	5	70	30	0	50	150

**Content:**

Sr. No.	Content	Total Hrs
1	Foundations: Subsurface Investigation Shallow Foundation : Necessity, Types, setting out, excavation, construction, failures of foundation and remedial measures, Deep Foundation: <i>Pile Foundation</i> : Introduction, uses, selection of pile, types of piles, pile cap and pile shoe, pile driving/ boring methods, causes of failures of piles, IS Code of piling IS2911 (Part I to IV) ; <i>Caissons</i> : 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	13
2	Masonry Construction : a) Stone masonry: Technical terms, joints, Classification of Stone masonry. b) Brick masonry: Technical terms, bonds in brick work. c) Other Masonry: Composite masonry, Hollow blocks masonry, Partition Wall, Cavity walls d) Lintels & arches: Lintels – types, construction. Arches – technical terms, types, construction. e) Wall Finishes: Plastering, pointing and painting	08
3	Plain and Reinforced Concrete Construction: Pre-cast and cast-in-situ Construction, Concrete 3D printing Form work: Form work for R.C.C. Wall, slab, beam and column, centering for arches of large spans, slip formwork – Horizontal & Vertical.	04
4	Building Components: Doors and Windows : a) Doors: Location, technical terms, size, types, construction, suitability.	16



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	b) Windows: Factors affecting selection of size, shape, location and no. of windows, types, construction, suitability, fixtures and fastenings, Ventilators Stairs and Staircases: Definition, technical terms, requirements of good stair, fixing of going and rise of a step, types of steps, classification, example – stair design/planning, elevators, escalators. Floorings: Introduction, essential requirements of a floor, factors affecting selection of flooring material, types of ground floors and upper floor, pre cast concrete floor. Roofs and Roof Coverings: Introduction, requirements of good roof technical terms, classification, types of roof coverings for pitched roof. A.C. sheet roofs – fixing of A.C. sheets, G.I. Sheets roofs, slates, flat roof – advantages, dis-advantages, types of flat terraced roofing.	
5	Special Works: Timbering in trenches, Control of Ground water in excavation, types of scaffoldings, shoring, underpinning, Coffor Dams, Diaphragm Walls, Demolition of structures. Special Treatments: Fire resistant, water resistant, thermal insulation, acoustical construction and anti-termite treatment.	10
6	Green Building as a solution to sustainable future, rating system for green building. Principles, Concepts and Case study	05

### Suggested Specification table with Marks (Theory): (For BE only)

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
20%	25%	25%	10%	10%	10%

**Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)**

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

### 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. Building Construction by Sushil Kumar
6. Building Construction by P.C Varghese, Prentice-Hall of India, New Delhi
7. Hand book of Heavy construction: O'Brien, Havers & Stubb
8. Bureau of Indian Standard



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**Course Outcomes: At the end of the course, Student will be able**

<b>Sr. No.</b>	<b>CO statement</b>	<b>Marks % weightage</b>
CO-1	Develop in- depth understanding about construction materials, building components, its construction process etc., and apply the knowledge to execute normal sized building construction project.	25
CO-2	Recognize the associated entities involved in building construction process.	20
CO-3	Identify the factors to be considered in planning and construction of buildings.	25
CO-4	Understand the practices and techniques for Temporary/Special construction Works.	15
CO-5	Able to apply learning to further research in sustainable civil engineering materials, construction technology and construction management field.	15

## **List of Practical:**

### **A) Site visit**

The student shall visit the construction site under supervision of faculty member /Site In-charge and prepare a brief report containing sketches and photographs of site visits based on the following assignments.

### **B) Assignment (Must contain Sketches)**

- (1) Assignment -1: Foundations & Setting Out work
- (2) Assignment -2: Masonry Construction
- (3) Assignment -3: Plain and Reinforced Concrete Construction
- (4) Assignment -4: Doors and Windows
- (5) Assignment -5: Stairs and Staircases
- (6) Assignment -6: Floorings
- (7) Assignment -7: Roofs and Roof Coverings
- (8) Assignment -8: Temporary/Special Works



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- (9) Assignment -9: Special Treatments
- (10) Assignment -10: Green Building

## **Major Equipment:**

Working models / Chart of various construction Activities.

## **List of Open Source Software/learning website:**

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