

GUJARAT TECHNOLOGICAL UNIVERSITY

CIVIL ENGINEERING (06)

BUILDING CONSTRUCTION

SUBJECT CODE: 2130607

B.E. 3rd Semester

Type of course:

Prerequisite: Student shall have studied basic Elements of Civil Engineering

Rationale: To develop capability to understand building components

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks						Total Marks
L	T	P		Theory Marks			Practical Marks			
			ESE (E)	PA (M)		PA (V)		PA (I)		
PA	ALA	ESE		OEP						
3	1	0	4	70	20	10	20	10	20	150

L- Lectures; T- Tutorial/Teacher Guided Student Activity; P- Practical; C- Credit; ESE- End Semester Examination; PA- Progressive Assessment

Sr. No.	Topics	Teaching Hrs.	Module Weightage
Module 1			
1	Introduction: Overview of construction practices, theory and methods.	10	20
2	Subsurface Investigation: Objectives, methods of boring like wash boring, percussion etc.,		
3	Shallow Foundations: Necessity, types, setting out, excavation, construction, failures of foundation and remedial measures.		
Module 2			
4	Masonry Construction : a) Stone masonry: Technical terms, lifting appliances, joints, types – random (un-coursed) rubble, coursed rubble, dry rubble masonry, Ashlar masonry- Ashlar fine, chamfered fine. b) Brick masonry: Technical terms, bonds in brick work- English bond, single & double Flemish bond, garden wall bond, raking bond, Dutch bond. c) Composite masonry: Stone facing with brick backing, brick facing with concrete backing. d) Hollow concrete blocks and construction	08	20

	e) Cavity walls: Brick cavity walls, position of cavity at foundation, roof and at opening levels. f) Lintels & arches: Lintels – types, construction. Arches – technical terms, types – brick arches, rough, axed, stone arches, flat – semi circular.		
5	Plain and Reinforced Concrete Construction: Pre-cast and cast-in-situ Construction		
Module 3			
6	Doors and Windows : a) Doors: Location, technical terms, size, types, construction, suitability. b) Windows: Factors affecting selection of size, shape, location and no. of windows, types, construction, suitability, fixtures and fastenings. c) Ventilators: Ventilators combined with window, fan light.	08	20
7	Stairs and Staircases: Definition, technical terms, requirements of good stair, fixing of going and rise of a step, types of steps, classification, example – stair planning, elevators, escalators.		
Module 4			
8	Floorings : Introduction, essential requirements of a floor, factors affecting selection of flooring material, types of ground floors, brick, flag stone, tiled cementconcrete, granolithic, terrazzo, marble, timber flooring, upper floor- timber, timber floor supported on RSJ flag stone floor resting on RSJ, jack arch floor, reinforced concrete floor, ribbed floor, pre cast concrete floor.	08	20
7	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, laying of big six sheets, G.I. Sheets roofs, slates, flat roof – advantages, dis-advantages, types of flat terraced roofing.		
8	Wall Finishes: Plastering, pointing and painting		
9	Temporary Works : Timbering in trenches , types of scaffoldings, shoring, underpinning		
Module 5			
10	Special Treatments: Fire resistant, water resistant, thermal insulation, acoustical construction and anti-termite treatment.	04	10
Module 6			
11	Green Building: Principles, Concepts and Case study	04	10

Reference Books:

1. Building Construction by Dr. B. C. Punamia
2. Building Construction by Sushil Kumar
3. Building Construction by Gurcharan Singh
4. Building Construction by S. C. Rangwala
5. Building Construction by P.C Varghese, Prentice-Hall of India, New Delhi
6. Indian Standard Institution, National Building Code of India, ISI, 1984, New Delhi

Course Outcome:

After successful completion of course the students shall be able to:

- Discuss sub surface soil strata investigation.
- Construct various types of shallow foundation.
- Execute various types of masonry.
- Construct various structural and non-structural building components.
- Erect various temporary works for new and existing buildings.
- Apply special treatments like water resistance, thermal insulation acoustical construction.
- Select appropriate method of construction.
- Explain causes of failure and remedial measures for foundations
- Explain the green buildings and suggest how to convert existing building in to green building.

Design based Problems/Open Ended Problems:

- 1) Setting out of foundation from lay out plan
- 2) Site Visit of Manufacturing of brick and reports detail, analysis of bricks N B C.
- 3) Preparing model of following roof works: North Light truss, Lean to Roofs, King post Truss, Queen Post Truss
- 4) Preparing Model of Various types of Stairs

*PA (M): 10 marks for Active Learning Assignments, 20 marks for other methods of PA

ACTIVE LEARNING ASSIGNMENTS: Preparation of power-point slides, which include videos, animations, pictures, graphics for better understanding theory and practical work – The faculty will allocate chapters/ parts of chapters to groups of students so that the entire syllabus to be covered. The power-point slides should be put up on the web-site of the College/ Institute, along with the names of the students of the group, the name of the faculty, Department and College on the first slide. The best three works should submit to GTU.