

GUJARAT TECHNOLOGICAL UNIVERSITY

B. E. FIRST YEAR

Subject Name: **Elements of Civil Engineering**

Subject Code: **110004**

Sr. No	Course Content	Total Hrs.
1.	Scope of Civil Engineering Introduction: Impact of Infrastructural Development on the Economy of a Country, Role of Civil Engineers, Importance of Planning, Scheduling and Construction Management.	03
2.	Surveying Introduction: Surveying and levelling, Object and uses, Primary divisions, Fundamental principles, Classification of surveying, Plans and maps, Scales, Units of measure.	04
	Linear measurements: Methods, Instruments used in chaining; Chain surveying, Ranging, Errors in chaining, Conventional symbols.	04
	Compass surveying: Types and uses of compass, Bearings, Whole Circle Bearings and Reduced Bearings, Computation of angles; Meridians & its related examples; declinations and dip of needle; Chain and compass surveying field work.	09
	Elevation measurements: Levelling, object and uses, terms used in levelling, leveling instruments, methods of levelling, recording and methods of reducing, errors in leveling & examples related to levelling, contours; characteristics and applications.	09
	Areas and volumes; use of a Planimeter	03
	Modern Tools of Surveying and Mapping: Introduction to Global Positioning System, Remote Sensing and Geographic Information System	03

3.	Construction Materials: Requirement, types, uses, properties and importance of Civil Engineering materials like Stone, Bricks, Lime, Cement, Ferrous and Non Ferrous Metals, Ceramic Materials, Timber, Sand, Aggregate, Mortar and Concrete, Paints and Varnishes, Glass , Plastic.	09
4.	Elements of Building Construction: Planning: Elementary principles and basic requirements of a building planning, layout of residential & industrial buildings. Introduction to Plan, Elevation & Section of Residential Building. Construction: Classification of buildings based upon occupancy and structure, Design Loads, Common building components, their functions, and nominal dimensions. Elements of building drawing, Introduction to building byelaws	12
5.	Water Resources Development: Elementary Hydrology, Sources of water, Watershed Development, water requirements and its conservation, Basic Introduction of Hydraulic Structures of Storage (Only Dams),	05
6.	Transportation Engineering: Role of Transportation in National development, Transportation Ways, Surface-Transportation and Aviation, BOT & BOOT Projects for Highways, Elements of Traffic Engineering and Traffic Control.	05

Reference Books:

1. Title : Surveying Vol .I & II
Author: Dr. B. C. Punamia
Publisher : Laxmi Publication Delhi
2. Title :Surveying Vol. I and II
Author : S. K. Duggal
Publisher : Tata Macgraw hill Publication New Delhi
3. Title: Civil Engg. Drawing
Author : S. C. Rangwala
Publisher: Charotar Pub. House Anand
4. Title : Building Construction
Author : Dr. B. C. Punamia
Publisher: Laxmi Pub. Delhi

5. Title : Engineering Material
Author : Dr. S.C. Rangwala
Publisher: Charotar Pub. House
6. Title : Highway Engineering
Author: Khanna S. K. and Justo C. E.G.
Publisher : Nemchand and Brothers
7. Title : Irrigation Engineering and Hydraulic Structures
Author : Santoshkumar Garg
Publisher : Khanna Publishers Delhi