



**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**Bachelor of Engineering**  
**Subject Code: 3110004**

**BASIC CIVIL ENGINEERING**  
**1<sup>ST</sup> YEAR**

**Type of course:** Engineering Science

**Prerequisite:**

**Rationale:**

**Teaching & Examination Scheme:**

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P		Theory Marks		Practical Marks		
				ESE (E)	PA (M)	ESE (V)	PA (I)	
3	0	2	4	70	30	30	20	150

**Course Content:**

Module	Content	Hours	Weightage
1.	<b>INTRODUCTION TO CIVIL ENGINEERING AND CIVIL ENGINEERING MATERIALS:</b> Introduction, Branches, Scope, Impact, Role of Civil Engineer, Units of measurement, Unit conversion (Length, Area, Volume). List of materials, Details (types, properties, uses) of materials: Cement, Aggregate, Brick, Steel, Concrete, Stone, Soil, Mortar, Timber, Plastic, Epoxy, Flyash, Steel slag, Copper slag, Bitumen, Optical fiber, Pipe, Wire, Cable, Smart material, Basic hand fill tests, FRP Water and waste water quality characteristics, drinking water standards, Road traffic, traffic control, traffic signals & Intersections.	10	20%
2.	<b>INTRODUCTION TO BUILDING AND TOWN PLANNING:</b> Definition and concept of plan of a simple residential building, Principles of planning, Elementary principles and basic requirements for building planning, elevation and section of a residential building. Principles of town planning, Necessity of town planning, Origin of town, Growth of town, Land use, Principles and objects of zoning, Advantages of zoning, Low cost housing, Prevention of slum, FSI.	08	20%
3.	<b>BUILDING CONSTRUCTION AND BUILDING SERVICES</b> <b>Building Construction:</b> Types of building, Components of building & its functions, types of loads acting on building, Types of brick bonds, Typical building layout, Symbols used in electrical layout, Symbols used for water supply, plumbing and sanitation. Nominal dimensions for door, window and furniture. <b>Building Services:</b> Types of building services like plumbing & sanitation, water supply & drainage system, electricity, building finishes, HVAC.	8	20%



**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**Bachelor of Engineering**  
**Subject Code: 3110004**

4.	<b>INTRODUCTION TO SURVEYING AND LEVELLING:</b> Introduction, Fundamental principles, Classification. <b>Linear measurement:</b> Instruments used, Chaining on plane ground, Offset, Ranging. <b>Angular measurement:</b> Compass-Instrument used Meridian, Bearing, and Local attraction. <b>Leveling:</b> Instrument used, Terminology, Types of leveling, and Methods of leveling, Introduction to contour <b>Modern tools:</b> Introduction to Theodolite, Total Station, Introduction to GPS, GIS & RS	11	20%
5.	<b>ADVANCEMENTS IN CIVIL ENGINEERING:</b> Smart city and it's features, Solid waste management systems, Mass Transportation systems-BRTS, Metro, Rain water harvesting systems, Watershed Management, Green building, Energy efficient building, Development of River fronts, Heritage structures & its conservations, Features of Earthquake resistant structures	8	20%
		45 hrs	100%

**Suggested Specification table with Marks (Theory):**

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
35	40	25	0	0	0

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

**Reference Book:**

Title	Author/s	Publication
Surveying and leveling	N. N. Basak	Tata McGraw Hill Education
Civil engineering drawing	S.C. Rangwala	Charotar Publication
Building Construction	Dr.B.C.Punmia	Laxmi Pub. Delhi
Engineering Material	S.C. Rangwala	Charotar Publication
Town Planning	S. C. Rangwala	Charotar Publication
Heavy Construction	V. N. Vazirani and S. P. Chandola	Khanna Publication
Building planning, designing and scheduling	Gurucharan Singh	Standard Publisher
Basic Civil Engineering	S. Ramamrutham	Dhanpatrai Publication
Soil Mechanics and Foundation Engineering	B.C. Punamia	Laxmi Pub. Delhi
Environmental Engineering	H.S. Peavy, D.R. Rowe and G. Tchbanoglous	McGraw Hill International Edition
Estimation and Costing In Civil Engineering	B. N. Dutta	Ubs Publishers Distributors
Estimating and Costing	S. C. Rangwala	Charotar Publishing House
Basic Civil Engineering	M.S.Palanichamy	McGraw Hill



**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**Bachelor of Engineering**  
**Subject Code: 3110004**

Basic Civil Engineering	Satheesh Gopi	Pearson Publisher
-------------------------	---------------	-------------------

**Course Outcome:**

Sr. No.	CO statement	Marks % weightage
CO-1	describe the use of different materials in Civil Engineering	20
CO-2	interpret various aspect of the building and town planning	30
CO-3	identify the various building components, method of constructions , and services	10
CO-4	use different equipments for angular and linear measurements	30
CO-5	describe various public transportation system, water conservation methods, water -waste water quality and advances in civil engineering	10

**List of Practical:**

Sr No	Name of Practical	Hours
1.	Unit conversation Exercise.	02
2.	Chart preparation of various materials. Collection of rate and sample. (field visit)	02
3.	Components of building (field visit)	02
4.	Planning of a residential building( plan, elevation& section of simple 1 room)	04
5.	Assignment based upon town planning module 4	02
6.	Linear and angular measurements (Chain and Compass) ( in field with instrument)	04
7.	Introduction to Theodolite & total station.	02
8.	Determine R.L of given point by Dumpy level. ( in field with instrument)	02
9.	Assignment based upon estimation.( simple, 1 room only)	02
10.	Videos showing working of construction Equipment's	04
11.	Presentation on BRTS / mass transportation system ( city bus)	04
12.	Seminar on green building & smart city	02
		32 hrs

**Web Material Links:**

- <http://nptel.ac.in/courses/105107122/>
- <http://nptel.ac.in/courses/105107157/>
- <http://nptel.ac.in/courses/105101087/>
- <http://nptel.ac.in/courses/105104100/>
- [www.svnit.ac.in](http://www.svnit.ac.in)