

Name of Program	:	Bachelor of Technology (B. Tech)
Course Code	:	1BCL01
Course Title	:	Fundamentals of Civil Engineering
Type of Course	:	Basic Engineering (BE)
Year of Introduction	:	2023-24

Prerequisite	:	-
Course Objective	:	To Provide exposure to the students with hands on experience on various basic Civil Engineering practices.
Course Outcomes	:	At the end of this course, students will be able to:
	CO1	To Learn Foundation concepts of Civil Engineering
	CO2	To Identify and characterize building materials & their manufacturing process, modern tools in Civil Engineering
	CO3	To Identify the factors to be considered in planning, practices and techniques for construction of buildings
	CO4	To Involve surveying activities of taking various measurements on ground that promote habit of working in groups, neatness and care in documentation.

Teaching and Examination Scheme

Teaching Scheme (Contact Hours)			Credits	Examination Marks				Total Marks
L	T	P		Theory Marks		Practical Marks		
				SEE	CIA	SEE	CIA	
3	0	2	4	70	30	30	20	150

Legends: L-Lecture; T-Tutorial/Teacher Guided Theory Practice; P – Practical, C – Credit, SEE – Semester End Examination, CIA - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)

Course Content

Unit No.	Topics	Teaching Hours	Weightage	Mapping with CO
1	Introduction and Scope of Civil Engineering: Branches & Function of Civil Engineering, Impact of Infrastructural Development on the Economy of a Country.	02	2%	CO1
2	Surveying: Introduction, Basic Definitions (Surveying, levelling, Plans, Maps, Scales), Introduction to divisions of surveying, Classification of surveying, Fundamental principles of	03	3%	CO4

	surveying, Measurement in Surveying, Phases of Surveying			
3	Linear measurements: Instruments used in chaining, Ranging: a). Direct - i. By Eye, ii. By Line Ranger b). Indirect, chaining: a). Chaining on Plane Ground b). Chaining on Sloping Ground - i. Direct (Stepping Method), ii. Indirect, Error in Chaining & tape corrections, Symbols used in Surveying	07	11%	CO3 CO4
4	Angular Measurements Introduction to Angular Measurement, Instruments used for angular measurement: a.) Compass, types of Compass b.) Theodolite c.) Difference between Compass & theodolite, Meridians & Types of Meridians, Bearings & Types of Bearing, Method of Bearing or System or Designation (Whole Circle Bearings and Reduced Bearings), Fore bearing & Back bearing), Plotting of Traverse & Computation of angles from Bearings, Local Attraction, Dip & Declination, Bowditch Rule.	08	20%	CO3 CO4
5	Elevation measurements: Basic Definitions, Measurements of Elevation by Height of Instrument (Line of Collimation method) and Rise & fall method, Methods of Levelling: Simple, Differential, Fly, Reciprocal Levelling, Check Levelling, Longitudinal Sectioning, Cross Sectioning, Precise levelling- Barometric levelling, Hypsometric Levelling, Trigonometric Levelling, Difficult Situation in Levelling, Contouring: Definitions, Characteristics of Contours, Applications, Use of Planimeter	08	20%	CO3 CO4
6	Modern Tools of Surveying and Mapping: Introduction to Global Positioning System, Remote Sensing and Geographic Information System	03	5%	CO2
7	Construction Materials: Requirement, types, uses, properties and importance of Civil Engineering materials like, Bricks, Cement, Timber, Sand, Concrete, steel	05	8%	CO2
8	Elements of Building Construction: Planning:	09	15%	CO3

	General Requirement of Building, Elementary principles and basic requirements of a building Planning, Importance of Planning, Layout of residential & industrial buildings, Introduction to Plan, Elevation & Section of Residential Building. Construction: Classification of buildings based upon occupancy, Types of Structures, Design Loads acting on the structure, Elements of building drawing, Introduction to building byelaws, Section of Wall Through Door & Window			
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Suggested Distribution of Theory Marks Using Bloom's Taxonomy						
Level	Remembrance	Understanding	Application	Analyse	Evaluate	Create
Weightage	10	30	40	10	5	5

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

Suggested List of Experiments/Tutorials

Sr. No.	Name of Experiment/Tutorial	Teaching Hours
1	Introduction to instruments	2
2	Chain survey	3
3	Compass survey (prismatic & survey compass)	3
4	Chain and compass surveying	4
5	Levelling	4
6	Layout of Residential building	4
7	Project: Plotting closed traverse	4
8	Civil Construction Material List	2
9	List of Latest Techniques	2
10	Construction Site Visit Report	2

Major Equipment/ Instruments and Software Required

Sr. No.	Name of Major Equipment/ Instruments and Software
1	Chain
2	Compass: Prismatic and Surveyor's
3	Levelling Staff
4	Ranging Rod
5	Measuring Tape
6	Electronic distance measurement device
7	Dumpy Level
8	Theodolite

Suggested Learning Websites

Sr. No.	Name of Website
1	http://www.nptel.iitm.ac.in/courses.php?branch=Civil
2	http://www.nptel.iitm.ac.in/courses/Webcourse-contents/IIT

Reference Books

Sr. No.	Name of Reference Books
1	Civil Engg. Drawing by S. C. Rangwala Publication Charotar Pub. House Anand
2	Surveying Vol. I & II by Dr. B. C. Punamia Publication Laxmi Publication Delhi
3	Title: Surveying Vol. I and II, Author: S. K. Duggal, Publisher: Tata Macgraw hill Publication New Delhi
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