

Elements of Civil Engineering

01CI1101

Objective of the Course:

- To impart brief fundamental concept related to various materials and their use in building construction
- To acquaint about the concept of linear, angular and elevation measurements.
- To verse about current and modern constructional practices.

Credit Earned: 04
Students learning outcomes:

After successful completion of the course it is expected that student will be able to,

1. Recognize importance of civil engineering and its day to day applications.
2. Interpret the plan/maps by locating the objects on ground from map and from site to on paper plan/map.
3. Describe qualitative comparison between different materials and its selection.
4. Create & interpret building planning and will be able to draw plan, section and Elevation.
5. Acquaint with the various modes of transportation.

Teaching and Examination Scheme

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial/ Practical Marks		Total Marks
Theory	Tutorial	Practical		ESE (E)	IA (M)	CSE (I)	Viva (V)	Term Work (TW)	
03	00	02	04	50	30	20	25	25	150

Detailed Syllabus

Sr No.	Title of the unit	Number of hours
1	Overview of Civil Engineering	03
	Evolution and broad disciplines of civil engineering, works of eminent civil engineers, scopes for a career as a civil engineer, construction as an industry, building & town planning, development of smart cities, common units used in practice of civil engineering & unit conversion, Construction Project Management.	
2	Surveying & Leveling	17

	Introduction: Applications, fundamental principles and classification of surveying, classification of plans & maps. Linear Measurement: Methods, instruments used in linear measurement, selection of stations, ranging, offsetting. Angular Measurement: Instruments used types of compass, types of meridians and bearings, measurement of bearings, computation of angles, compass traversing and correction of bearings for local attraction. Leveling: Aims and applications, definition of various terms, instruments for leveling, methods of leveling, recording observations in level-book, computing reduced levels by HI and rise & fall method, definition of contour, characteristics of contours of different terrains and application of contour maps. Modern Surveying Tools: Introduction to theodolite, total station, GIS, GPS & remote sensing.	
3	Building Materials	09
	Stone: Introduction to stone, uses of stone, characteristics of good building stone, availability, suitability and properties of different stone. Bricks: Comparison between stone work and brick work, advantages of bricks, characteristics of good brick, standard test for brick along with field test for brick. Lime: Classification of lime, precautions in handling lime. Cement: Basic ingredient of ordinary cement, physical properties of cement, field examinations of cement, storing of cement and its uses. Timber: Introduction to timber, importance of seasoning, wood base product. Steel: Introduction, use of different form of steel, marketable forms of steel. Aggregates: Classification, source, mechanical properties. Bitumen: Classification, properties. Plastic: Properties of plastics, types and uses of plastic.	
4	Building Planning & Construction	06
	Classification of buildings, types of load acting on building, building components & their functions, principles of planning, conceptual planning of residential & public building	
5	Transportation Engineering	05
	Role of transportation in national development, modes of transportation, types of roadways, introduction to traffic engineering, introduction to urban transportation system	
6	Advancement in Civil Engineering	02
	Building automation, green building, advanced materials, sky scrapers, civil engineering wonders in the world	
	Total	42

List of Practical

- 1) Linear Measurement.
- 2) Perimeter Measurement.
- 3) Area Measurement.
- 4) Angular Measurement.
- 5) Profile Leveling Survey Project.

- 6) Basics sign & conventional symbols.
- 7) Building planning drawing sheet.

Suggested Theory Distribution

The suggested theory distribution as per Bloom's taxonomy is as per follows. This distribution serves as guidelines for teachers and students to achieve an effective teaching-learning process

Distribution of Theory for course delivery and evaluation					
Remember	Understand	Apply	Analyze	Evaluate	Create
30%	30%	10%	10%	10%	10%

Instructional Method and Pedagogy:

1. At the start of course, the course delivery pattern, prerequisite of the subject will be discussed.
2. Lectures will be taken in class room with the use of multi-media presentations, black board – mix of both.
3. Attendance is compulsory in lectures and laboratory which carries a 5% component of the overall evaluation.
4. Minimum two internal exams will be conducted and average of two will be considered as a part of 15% overall evaluation
5. Assignments based on course content will be given to the students at the end of each unit/topic and will be evaluated at regular interval. It carries a weightage of 5%.
6. Surprise tests/Quizzes will be conducted which carries 5% component of the overall evaluation.
7. The course includes a laboratory, where students have an opportunity to build an appreciation for the concepts being taught in lectures. Minimum 8 experiments are planned based on the course content.

Recommended Study Material**Text Books:**

1. Introduction to civil Engineering by Bhogayata, Shah & Vora – Tata McGraw hill.

Reference Books:

1. Surveying Vol. I by B.C. Punamia.
2. Building construction by B.C. Punamia.
3. Building Material by S.C.Rangwala.
4. Highway & Transportation engineering by Khanna & Justo.