25CV102: Basics of Civil Engineering

w. e. f. Academic Year:	**2025-26**
Semester:	**1/2**
Category of the Course:	**Engineering Science**
Prerequisite:	Zeal to learn the subject
Rationale:	The Introduction to Civil Engineering course is designed to provide first-year students with a foundational understanding of the vast field of civil engineering. The course aims to familiarize students with the scope, sub-disciplines, and practical applications of civil engineering in shaping and improving society's infrastructure.

Course Outcomes:

After Completion of the Course, Student will able to:

	Course Outcome (CO)	**RBT Level (Cognitive Domain)**
CO1	Understand the basic definition, branches, basic instruments and scope of civil engineering and explain the role of civil engineers in national infrastructure development.	Understand
CO2	Apply the principles of building planning and identify components of buildings, their functions, and site selection criteria in accordance with building by-laws.	Understand/ Apply
CO3	Classify and explain the properties, uses, and tests of common construction materials such as stone, bricks, cement, timber, steel, and aggregates.	Understand/ Apply
CO4	Describe sources of water, its requirements, conservation methods, and the basic functions of hydraulic structures like gravity dams.	Understand / Create
CO5	Explain the importance of transportation in national development and identify various modes of transportation and elements of traffic engineering.	Understand/ Apply / Analyze
CO6	Recognize modern advancements in civil engineering including smart cities, green buildings, and the application of GPS, GIS, and Remote Sensing.	Understand/ Apply

Teaching and Evaluation Scheme:

Teaching Scheme					**Examination Scheme**				
L	**T**	**P**	**C**	**Hrs/Week**	**IE**	**Theory**	**CIA**	**Practical**	**Total Marks**
02	-	02	03	04	40	60	30	20	150

IE: Internal Evaluation Theory: Theory Exam (End Semester)

CIA: Continuous Internal Assessment Practical: Practical Exam (End Semester)

Detailed Syllabus:

Topic		Hrs.	% of Weightage
UNIT: 1	**Introduction of Civil Engineering :**	**03**	**08**
Basic definition, Branches and scope of civil Engineering, Role of civil engineer, Impact of infrastructural development on economy of country.			
UNIT: 2	**Building planning ,construction and services:**	**08**	**22**
Building Planning and Construction : principles of planning, Definitions of terminologies related to building plan, Classification of building, building components and its functions, Introduction to Building by laws, Site Selection and requirement criteria for residential and Industrial Building **Introduction to Building Services**: Types of building services like plumbing & sanitation, water supply & drainage system, electricity, building finishes, HVAC			
UNIT: 3	**Building materials**	**06**	**20**
Stone: Introduction to stone, uses of stone, characteristics of good building stone, availability, suitability and properties of different stones. **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. **Cement:** Basic ingredients of ordinary cement, physical properties of cement, Types of cement, storing of cement and its uses. **Concrete:** Basic ingredients of concrete, Method of mixing, requirement of concrete, properties and 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.			
UNIT: 4	**Water Resources Development**	**04**	**18**
Sources of water, Water requirements and Conservation of water (Necessity, objective, benefits & measures), Basic Introduction of Hydraulic Structures of Storage (Gravity Dam)			
UNIT: 5	**Transportation Engineering**	**05**	**18**
Role of Transportation in National development, Transportation Ways, Surface-Transportation and Aviation, Mass Transportation system, Elements of Traffic Engineering and Traffic Control Devices			
UNIT: 6	**Advances in Civil Engineering**	**04**	**14**
Smart city and it's features, Green building, Introduction to GPS, GIS & RS			
		30	**100**

List of Practical:

Topic	Hrs
Chain Surveying	04
Compass Surveying	04
Basics symbols, Abbreviations	04

Plan elevation section of residential building	06
Furniture layout and Electrification of residential building	02
Elevation measurement (Dumpy level)	04
Presentation on past and present government Civil engineering projects.	06
	30

Reference Books:

1. Introduction to civil Engineering by Bhogayata, Shah &Vora – Tata McGraw hill.
2. Surveying Vol. I by B.C. Punamia.
3. Building construction by B.C. Punamia.
4. Building Material by S.C.Rangwala.
5. Highway & Transportation engineering by Khanna & Justo

Course Outcomes Mapping:

CO	Course Outcome (CO)	POs/ PSOs Mapped	Cognitive Level (RBT)	Knowledge Category	Lecture (Hrs)	Lab (Hrs)
CO1	Understand the basic definition, branches, basic instruments and scope of civil engineering and explain the role of civil engineers in national infrastructure development.	PO1, PSO1	Understand, Apply	Conceptual	03	12
CO2	Apply the principles of building planning and identify components of buildings, their functions, and site selection criteria in accordance with building by-laws.	PO2, PO3, PO4, PSO1	Understand, Analyze, Apply	Procedural	10	08
CO3	Classify and explain the properties, uses, and tests of common construction materials such as stone, bricks, cement, timber, steel, and aggregates.	PO1, PO2, PO5, PSO1,	Apply	Procedural	06	04
CO4	Describe sources of water, its requirements, conservation methods, and the basic functions of hydraulic structures like gravity dams.	PO1,PO2, PO5, PSO1, PSO2	Analyze, Apply	Procedural, Conceptual	04	02
CO5	Explain the importance of transportation in national development and identify various modes of	PO1, PO3, PO10,PSO1	Apply	Procedural	04	02

	transportation and elements of traffic engineering.					
CO6	Recognize modern advancements in civil engineering including smart cities, green buildings, and the application of GPS, GIS, and Remote Sensing.	PO1, PO3, PO5, PSO1,	Analyze, Apply	Procedural Conceptual	03	02

Mapping of COs with POs & PSOs:

CO	PO												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	3												3	
CO2		3	3	2									3	
CO3	3	3			3								3	
CO4	3	3	3		3								3	1
CO5	3		3							1			3	
CO6	3		3		3								3	

3: High, 2: Medium, 1: Low