

**ES115: BASIC CIVIL ENGINEERING
CREDITS - 4 (LTP:3,0,1)**

Course Objectives:

1. Impart knowledge of surveying & Construction.
2. Develop basic concepts of building construction.
3. Appraise about the modes of transportation.
4. Develop basic concepts of water harvesting

Teaching and Assessment Scheme:

Teaching Scheme			Credits	Assessment Scheme				
L	T	P		Theory Marks		Practical Marks		Total Marks
			ESE	CE	ESE	CE		
3	0	2	4	60	40	20	30	150

Course Contents:

Unit No.	Topics	Teaching Hours
1	Introduction To Civil Engineering: Introduction, Branches and Scope of civil engineering, Role of Civil Engineer, Units of measurement, Unit conversion (Length, Area, Volume).	02
2	Civil Engineering Materials: Introduction of civil engineering materials and classification. Properties, uses and list of tests of materials: Brick, Cement, Aggregate, Mortar, Concrete, Timber and Metal.	06
3	Building Planning And Construction: Concept of building plan and building drawing, Principles of planning and architecture, Preparation and study of one room building planning and drawing. Concept of main stack holders: client, contractor and consultant. Building Construction: Types of building, Components of building & its functions, types of loads on building, load bearing and framed structure, Introduction to electrical layout, water supply, plumbing and sanitation. Concept of HVAC, Nominal dimensions for rooms, doors, windows, ventilators and various levels of constructions in a building.	12
4	Surveying And Levelling: Introduction, Fundamental principles, Classification. Linear measurement: Instruments used, Chaining on plane ground, Offset, Ranging. Angular measurement: Compass-Instrument used Meridian, Bearing, and Local attraction. Leveling: Instrument used, Terminology, Types of leveling, and Methods of leveling, Introduction to contour, Modern tools: Planimeter. Introduction to Theodolite, Total Station, Introduction to GPS, GIS & RS	10
5	Water Resources Engineering And Transportation System: Hydrologic Cycle, Sources of water, Introduction to Hydraulic Structures, Classification of canals, Water Conservation. Introduction to modes of transportation: Roadway and Railways. Cross section of roadway and functions of each component, cross section of railway track and functions of each component.	8

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Unit No.	Topics	Teaching Hours
6	Advancements In Civil Engineering: Green building, Energy efficient building, Smart city and its features, Mass Transportation systems-BRTS, Metro, Features of Earthquake resistant structures, Rain water harvesting systems.	4
Total		42

Reference Books:

1. Dr. B. C. Punmia, Ashok kumar Jain, Arunkumar Jain, “*Surveying, Vol. I*”, 16th Edition. Publisher: Laxmi Publication Delhi.2005.
2. Duggal S. K., “*Surveying Vol. I,*” Tata McGraw Hill Publication, New Delhi.
3. Dr. B. C. Punmia, Ashokkumar Jain, Arunkumar Jain, “*Building Construction*”, 5th Edition, Laxmi Publication. Delhi.-ISBN-81-7008-053-3
4. S. K. Duggal, “*Building Materials*”, New Age International Publishers, 2008 ISBN (13) : 978-81-224-2975-6
5. Dr. R. K. Jain and Dr. P. P. Lodha, “*Elements of Civil Engineering*”, 1st edition, McGraw Hill Education, India Pvt.Ltd.2014.
6. F.S.Umrigar and J.H.Patel, “*Basic Civil Engineering*”, 2nd Edition, Atul Prakashan, Ahmedabad, 2004.
7. Relevant IS codes and National Building Code.

Course Outcomes:

After learning the course the students shall be able to:

1. Possess knowledge of scope & role of civil engineering and suitability of materials.
2. Apply fundamental principles of surveying, leveling to comprehend field measurements.
3. Understand importance of building drawing and processes for building construction.
4. Understand water resources and transportation system
5. Gain awareness of advancements in Civil Engineering