

1154CE105 (VTUR15)	CONSTRUCTION ENGINEERING	L	T	P	C
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COURSE CATEGORY: Institute Elective

A. PREAMBLE :

To understand the planning and execution of construction activities and construction materials and equipment.

B. PRE-REQUISITES:

- NIL

C. COURSE EDUCATIONAL OBJECTIVES:

Students undergoing this course are expected to:

- Understand the different methodologies for site selection and investigation.
- Differentiate the various materials available for construction activities.
- Outline the construction planning and equipment.

D. COURSE OUTCOMES:

Upon the successful completion of the course, learners will be able to

CO	STATEMENT	K LEVEL
CO1	Demonstrate the site selection and site investigation processes.	K2
CO2	Classify the various construction materials and their properties.	K2
CO3	Illustrate the ingredients and methods of concreting.	K2
CO4	Compare the equipment used in various construction activities.	K2
CO5	Outline the planning and execution of a building's construction.	K2

CORRELATION OF COs WITH POs:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	M											
CO2	L											
CO3	M											
CO4	L											
CO5	L											

E. COURSE CONTENT

UNIT I SITE SELECTION RECONNAISSANCE 9

Site visit – Reconnaissance – type of soil – ground water conditions – site exploration – Local topography – escarpments, excavations, cuttings, fillings, quarries. Water levels in wells, streams. Flood marks – drainage pattern. Evidence of erosion on land slides. Finalizing the appropriate site. Soil sampling – typical bore log. Importance of testing of soils at the site and in the laboratory. Determination of bearing capacity based on field tests and laboratory tests (simple methods considering with and without water table). Concept of smart cities. Remote Sensing, GIS, GPS.

UNIT II CONSTRUCTION MATERIALS 9

Bricks – ingredients – composition – classification. Steel – uses – classification – composition – raw materials. Water – quality assurance. Wood – uses – classification – types – Bamboo as a construction material. Glass – types – uses. Aluminum – composition – classification. Varnish – paints – sealants – admixtures – uses. Masonry - types – uses. Bonds – English Bond, Flemish bond (demonstration). Composites – uses. Alternate materials used in construction. Smart materials – types – Eco friendly materials used in construction. Asbestos – composition – disadvantages.

UNIT III CONCRETING METHODS 9

Concrete – ingredients – preparation of concrete – ready mix – small scale – strength characteristics – admixtures. Uses of mix-design method. Preparation of 10 cm³ and 15 cm³ size cubes – reasons – testing of cubes in the laboratory. Concrete – placing – curing – minimum required duration. Types of concrete – special concreting methods – Under water concreting. Pre-cast and prefabricated elements. Pre-stressed concrete structures. Ready mix concrete and transportation methods.

UNIT IV CONSTRUCTION EQUIPMENTS

9

Earthwork – earth moving operations. Types of earthwork equipment – tractors, motor grades, scrapers, front end loaders – earth movers. Compactors – sheep foot rollers – vibroflotation. Pile driving equipments – hammers. Concreting – batching, mixing, hauling. Material handling equipments. Erection of structures. Equipments for dredging, trenching, tunneling, etc.

UNIT V PLANNING AND EXECUTION

9

Types of building foundation. Basic concepts in developing plan, elevation, isometric view. Assessing the loads – live load – dead load – earthquake load – wind forces. Estimation and costing – application of software packages. Construction scheduling – contracting – agreement. Planning for Energy saving arrangements. Role of Architect. Role of Civil engineer.

TOTAL: 45PERIODS

F. LEARNING RESOURCES:

a) TEXT BOOKS

1. Shetty M.S., Concrete Technology, S.Chand and Company Ltd. Delhi, 2008.
2. Santhakumar.A.R. Concrete Technology, Oxford University Press, 2016.
3. Denison Campbell, Allen and Harold Roper, Concrete Structures, Materials, Maintenance and Repair, Longman Scientific and Technical UK, 1991.
4. Chitkara, K.K., Construction Project Management: Planning, Scheduling and Control, McGraw-Hill Publishing Company, New Delhi, 2005.

b) REFERENCES

1. IS 456:2000, Plain and Reinforced Concrete, Code of Practice, Bureau of Indian Standards, Manak Bhawan, No.9, Bhadur Shah Zafar Marg, New Delhi 110 002.
2. IS 2212:1991, Brick Works, Code of Practice, Bureau of Indian Standards, Manak Bhawan, No.9, Bhadur Shah Zafar Marg, New Delhi 110 002.