SEMESTER S6

INTRODUCTION TO CONSTRUCTION ENGINEERING

Course Code	OECET611	CIE Marks	40
Teaching Hours/Week (L: T:P: R)	3:0:0:0	ESE Marks	60
Credits	3	Exam Hours	2 Hrs. 30 Min.
Prerequisites (if any)	None	Course Type	Theory

Course Objectives:

1. Identify the properties and applications of different construction materials
2. Understand the principles of concrete mix design and production
3. Learn various building systems and components
4. Comprehend the role of emerging trends and technology innovations in construction

SYLLABUS

Module No.	Syllabus Description	Contact Hours
1	**Construction Materials** Mortar – Types – properties – uses. Timber products – properties & uses of plywood, fibre board, particle board. Cement - Manufacturing, chemical composition, Tests on cement – specific gravity, standard consistency, initial and final setting time, fineness, soundness, compressive strength, IS specifications Aggregates – types, Gradation, importance of gradation, bulking of fine aggregate Iron and Steel –Reinforcing steel – types – specifications. Structural steel – specifications Admixtures, uses – mineral admixtures – fly ash and ground granulated blast furnace slag and chemical admixtures – plasticizers, super plasticizers, accelerators, retarders (brief discussion only)	9
2	**Concrete Technology** Process of manufacturing concrete – batching, mixing, transportation, placing, compacting, finishing, curing Properties of fresh concrete: Workability, factors affecting workability, test on	9

KTU SPECIAL

	workability (slump test), segregation and bleeding (brief discussion) Properties of hardened concrete: Strength, factors affecting strength, tests for strength of concrete in compression, tension and flexure Concrete quality control – statistical analysis of results – standard deviation – acceptance criteria – mix proportioning (B.I.S method) – nominal mixes.	
3	**Building Construction** Preliminary considerations for shallow and deep foundations Masonry – Types of stone masonry Lintels and arches – types and construction details. Tall Buildings – Framed building – steel and concrete frame – structural systems –erection of steel work–concrete framed construction– formwork – construction and expansion. joints Introduction to prefabricated construction – slip form construction	**9**
4	**Construction Technology** Cost-effective construction – rapid wall construction, soil-cement block masonry, voided slab technology, filler slab technology Basic concept of prestressing – fundamental understanding of pre-tensioned and post-tensioned construction Construction 3D printing (brief discussion only) Building failures – General reasons – classification – Causes of failures in RCC and Steel structures, Failure due to Fire, Wind and Earthquakes. Foundation failure – failures by alteration, improper maintenance, overloading. Retrofitting of structural components - beams, columns and slabs	**9**

KTU SPECIAL

Course Assessment Method

(CIE: 40 marks, ESE: 60 marks)

Continuous Internal Evaluation Marks (CIE):

Attendance	Assignment/ Microproject	Internal Examination-1 (Written)	Internal Examination- 2 (Written)	Total
5	**15**	**10**	**10**	**40**

End Semester Examination Marks (ESE)

In Part A, all questions need to be answered and in Part B, each student can choose any one full question out of two questions

Part A	Part B	Total
• 2 Questions from each module. • Total of 8 Questions, each carrying 3 marks **(8x3 =24marks)**	• Each question carries 9 marks. • Two questions will be given from each module, out of which 1 question should be answered. • Each question can have a maximum of 3 sub divisions. **(4x9 = 36 marks)**	**60**

Course Outcomes (COs)

At the end of the course students should be able to:

	Course Outcome	Bloom's Knowledge Level (KL)
CO1	Describe the characteristics and uses of common construction materials	**K2**
CO2	Design and specify concrete mixes for different applications	**K3**
CO3	Identify and explain various building systems and components	**K2**
CO4	Describe the impact of emerging trends and innovations on construction	**K3**

Note*: K1- Remember, K2- Understand, K3- Apply, K4- Analyse, K5- Evaluate, K6- Create*

CO-PO Mapping Table (Mapping of Course Outcomes to Program Outcomes)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	-	-	-	1	2	-	-	-	-	3
CO2	3	-	-	-	-	1	2	-	-	-	-	3
CO3	3	-	-	-	-	1	2	-	-	-	-	3
CO4	3	-	-	-	1	1	2	-	-	-	-	3

Note: *1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), -: No Correlation*

KTU SPECIAL

Text Books				
Sl. No	**Title of the Book**	**Name of the Author/s**	**Name of the Publisher**	**Edition and Year**
1	Advanced Construction Technology	Roy Chudley, Roger Greeno	Prentice Hall	4th Ed, 2006
2	Architectural Design with SketchUp	Alexander C. Schreyer	John Wiley & Sons	3rd Ed, 2023
3	Building materials & construction	Anil Kumar Mishra	S. Chand Publishers	1st Ed, 2018

Reference Books				
Sl. No	**Title of the Book**	**Name of the Author/s**	**Name of the Publisher**	**Edition and Year**
1	Fundamentals of Building Construction: Materials and Methods	Edward Allen, Joseph Iano	Wiley Publishers	7th, 2019

KTU SPECIAL

Video Links (NPTEL, SWAYAM…)	
Module No.	**Link ID**
1	https://nptel.ac.in/courses/105102088
2	https://archive.nptel.ac.in/courses/105/102/105102012/