

Construction Engineering

Course Code	Credit Hours
CE-113	2-0

Course Description

This course is designed to equip students with a comprehensive understanding of building construction activities and their sequences, preparing them to effectively manage the practical tasks of a Site Engineer in their professional careers. Civil engineers play a crucial role in overseeing and directing the physical construction of projects from inception to completion, ensuring that design plans are transformed into fully functional facilities. They are also responsible for maintaining rigorous quality control throughout the project lifecycle.

Text Book:

1. MES Schedule of Rates 2014.

Reference Book:

1. Building Construction by Arora & Gupta, 6th Edition, Satya Prakashan, 1988.
2. Professional Practice (Estimation/& Valuation) by Roshan Namavati, Union Book Stall, M, A Jinnah Road Karachi.
3. Stephens W. Nunnally, Construction Methods and Management, 8th Edition, 2013.
4. Metha M., Scarborough W., Armpriest D. 2013 Building Construction: Principles, Materials, and Systems, Pearson.
5. Fundamentals of Building Construction: Materials and Methods, 5th Edition. Edward Allen.
6. Huntington, W. C. Building Construction, John Wiley & Sons. John Wiley & Sons Inc; Subsequent Edition (February 1, 1987).
7. Thompson J. F., Building Construction, Butter world London.
8. R. L. Peurifoy, W. B. Ledbetter, C. J. Schexnayder, Cliff J. Schexnayder. Construction Planning Equipment and Method. 5th Edition, McGraw-Hill Companies

Prerequisites:

Nil

Assessment System for Theory

	Without Project (%)	With Project/Complex Engineering Problems (%)
Quizzes	15	10-15
Assignments	10	5-10
Mid Terms	25	25
Project	-	5-10
End Semester Exam	50	45-50

Teaching Plan

Theory:

<u>Week</u>	<u>Topic Covered</u>	<u>Reading Assignment/ Home Work</u>		<u>CLO No</u>	<u>Assessment Methodology</u>
1-4	Construction Industry:	Handouts		1	Assignments, Quizzes, MSE, CEP, OEL & ESE
	<ul style="list-style-type: none"> Introduction to Construction Projects and Categories 				
	<ul style="list-style-type: none"> Types of Civil Engineering Structures, Building Permits, Codes and Construction Standards. 		Assignment 1		
	<ul style="list-style-type: none"> Stages of Construction, Site Selection and Orientation of Buildings, 		Quiz 1		
5	Excavations:	Ref Book (3)		2	
	<ul style="list-style-type: none"> Excavation and Related Aspects: 				
	<ul style="list-style-type: none"> (a) Methodologies in different types of soils, 				
	<ul style="list-style-type: none"> (b) Stability of Excavations. Safety Precautions and Solution of Particular Problems arising out of condition of Sub-Soil at Site. 				
6	Substructures			1	
	<ul style="list-style-type: none"> Understanding the Geotech Report, Compaction criteria of soils for Buildings and Roads, Backfill Specs 	Ref Book (3)	Assignment 2		
	<ul style="list-style-type: none"> Foundations: Method of Construction for different types of footings, Piling Works, Use of Sulphate Cement. 		Quiz 2		

7	Masonry Construction:				1
	•	Brick, Stone & Block Masonry, Type of Bonds, Types of Mortars, Masonry in Seismic Zones, Construction Methodology,	Ref Book (1)		
	•	Quality Control Measures, Damp Proof Courses, Plinth Protection and Pointing and Plaster. Crew Size	Handouts		
8	Wood Works:				1
	•	Types of Wood, Seasoning Procedures, Types of Doors,	Handouts	Assignment 3	
	•	Windows & Floors, Fitting/Fixtures and Hardware, Quality Control Measures.	Handouts	Quiz 3	
9	Mid Semester Exam				
10	Finishing Works:				1
	•	Paint, Distemper, Weather Shield, Tiling, Marble, Metal Finishing Works etc	Handouts		
	•	Design detailing			
11	Roof Insulation:				1
	•	Types, Techniques and Quality Issues.	Handouts	Assignment 4	
	•	Construction Requirements and Methods of laying sewers, sui gas plumbing, water supply and drainage systems.		Quiz 4	
12	Temporary Works:				2
	•	Overview of Temporary Structures, Types and Uses of Formwork for various Building Units/ members, Stripping Times, Safety Precautions.			
	Structural Construction:				2
	•	Reinforced Concrete Frame Construction such as columns, beams, slab, roof, pre-stressed concreting.		Assignment 5	
	•	CMD and Timelines, Curing, Concrete pouring machinery and Quality Control Measures.		Quiz 5	
13	Reinforcement:				1
	•	Steel fixing practice, understanding	Ref Book		

	test results and requirements, Standard reinforcement detailing techniques, Overview of Steel Construction.	(1)			
14-15	Overview of Construction Aspects of Infrastructure Engineering Projects:				
	• Pavements - Introduction to Types, Typical Sections and Materials, Methodology for Construction and Repair		Assignment 6	2	
	• Quality Control Measures and Tests requirements, Understanding JMF, Construction Joints.		Quiz 6		
	• Different type of equipment and machinery used in concrete pouring and infrastructure works.	Ref Book (8)			
16	Construction Equipment Selection				
	• Evaluating various options based on economic principles,			2	
	• Determine the most cost-effective and efficient machinery for project requirements.	Ref Book (8)			
17-18	End Semester Exam				

Practical: Nil.