Techno India NJR Institute of Technology

Course File

FOUNDATION DESIGN LAB
(6CE4-25)

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Department of CE

6CE4-25: FOUNDATION ENGINEERING

Credit: 1 **Max. Marks: 50(IA:30, ETE:20)**
0L+0T+2P **End Term Exam: 2 Hours**

1. Design of isolated shallow footings, combined footings, raft foundations.
2. Design of pile foundations.
3. Design of wells and cassions.
4. Design of machine foundation.
5. Design of retaining structures etc

Course Overview:

This course in intended to develop professional skills for Engineers who wish to pursue their career in Structural Engineering. This course is also valuable for practicing structural engineers, as a refresher and reference. This course teaches you step by step procedure for Structural Design of foundations.
How to use data from STAAD pro software, exporting and utilization in Structural design.
Interpreting Geotechnical Reports, to extract Soil parameters for Structural design.
Get in depth understanding of Design standards and codes relevant to respective technical clauses.
Understating of concepts of Basic Solid Mechanics behind Structural Engineering.
Learn Practical aspects of Structural Design. Examples from Live design Projects.
Ready to use downloadable Excel design worksheets are provided as downloadable resources.
Finite element approach for design of Raft foundation with STAAD pro software.
Local axis convention in STAAD pro for finite elements plates is clearly illustrated and how it different from Local axis of beam element. Importance of direction of forces has been illustrated with diagrams and commentary. Relevant sections from STAAD pro technical reference, have been illustrated for better understanding. Techniques to develop, Stable and Economical Structure. Trouble shooting errors and warnings, occurring while analysis with STAAD Pro software. Providing Stability criteria for foundations and design procedure to ensure Stability of foundations. Optimization solutions for Structural models.

Course Outcomes:

CO.NO.	Cognitive Level	Course Outcome
1	**Comprehension**	Students will be able to create designs of isolated shallow footings, combined footings, raft footings.
2	**Application**	Students will be able to create designs of retaining structures.
3	**Analysis**	Students will be able to create designs Pile Foundations.
4	**Synthesis**	Students will be able to create designs of well foundations.
5	**Evaluation**	Students will be able to create designs of Cessions.

Prerequisites:

1. Fundamentals knowledge of RCC design.
2. Fundamentals knowledge of Indian Standards
3. Fundamentals knowledge of mathematics.

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Dr. Pankaj Kumar Porwal
(Principal)

Course Outcome Mapping with Program Outcome:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
Course Outcome	3	3	3	3	2	2	2	1	1	1	2	3	2	1	1
	3	2	2	3	2	1	2	1	1	1	1	1	2	1	1
	2	2	2	1	2	2	2	2	1	1	2	1	2	1	1
	3	2	2	2	2	2	1	1	2	1	2	2	2	1	1
	3	3	3	32	1	2	1	1	1	1	2	2	2	1	1
CO364 (AVG)	2.8	2.4	2.4	8.2	1.8	1.8	1.6	1.2	1.2	1	1.8	1.8	2	1	1

Course Coverage Module Wise:

Lecture No.	Experiment No.	Topic
1		Introduction: Objective, scope and outcome of the lab
2	1-A	Design of isolated shallow footings
3	1-B	Design of combined footings
4	1-C	Design of raft foundations
5	2	Design of pile foundations
6	3	Design of wells
7	3-A	Design of cassions
8	4	Design of machine foundation
9	5	Design of retaining structures

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Faculty Lab Manual Link
https://drive.google.com/file/d/1Ga-r6FKtgp2ZBEux_yNmLVsD2SkkmvjJ/view?usp=share_link

Viva QUIZ Link

1. https://www.objectivebooks.com/foundation-engineering-mcq-practice
2. https://quizlet.com/ca/452775008/foundation-design-test-1-flash-cards/
3. https://engineeringinterviewquestions.com/mcqs-on-foundation-answers/
4. https://testbook.com/objective-questions/mcq-on-soil-mechanics-and-foundation-engineering--5eea6a0e39140f30f369e50b

Assessment Methodology:

1. Practical exam on RCC structures.
2. Internal exams and Viva Conduct.
3. Final Exam (practical paper) at the end of the semester.