Advanced Foundation Engineering - Web course

COURSE OUTLINE

This course introduces the fundamental concepts, advanced principles and application of foundation analysis and design to the undergraduate students of civil engineering.

Contents:

- Subsurface Exploration, Shallow Foundations - Ultimate bearing capacity, Safe bearing pressure, settlement analysis.
- Design of Combined and Raft foundations, Design of Retaining walls, Sheet pile walls, Braced cuts, Pile foundations, Drilled piers and Caissons.
- Machine Foundations, Concept of reinforced earth.

COURSE DETAIL

Sl. No.	Topic	No. of Hours
1	**Subsurface Exploration:** • Boring, Sampling, SPT, CPT, Geophysical methods, Bore log and soil report. .	02
2	**Shallow Foundations:** • Terzaghi's, Meyerhoff, Hansens bearing capacity theories, based on SPT, layered soils, eccentric and inclined loads. • Bearing capacity on slopes, Foundation settlements.	08
3	**Design of Combined and Raft Foundations :** • Design of combined footings by Conventional and elastic line methods.	04
4	**Design of Retaining walls :** • Lateral earth pressure, Retaining wall stability.	03
5	**Sheet Pile Walls :** • Cantilever and Anchored sheet pile walls.	02

NP-TEL

NPTEL

http://nptel.iitm.ac.in

Civil Engineering

Pre-requisites:

1. Soil Mechanics (Geotechnical Engineering I).
2. Foundation Engg (Geotechnical Engineering II).

Additional Reading:

1. Literature on Advanced foundations IS codes on foundations.

Coordinators:

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6	**Braced Cuts :** • Pressure envelopes and design of various components.	01
7	**Pile Foundations :** • Load transfer mechanism, Pile capacity in various soil types, negative skin friction, group action, settlements, laterally loaded vertical piles.	06
8	**Drilled Piers and Caissons :** • Design considerations, bearing capacity equations, Settlements, Lateral loads, Types of caissons, stability analysis.	04
9	**Machine Foundations :** • Free and forced vibration with and without damping, Elastic half space for rigid footings. • Vibration analysis of foundations subjected to vertical, sliding and rocking modes, Design criteria for m/c foundations.	06
10	**Reinforced Earth :** • Materials and general considerations, Design and Stability.	04

References:

1. Joseph Bowles, "Foundation Analysis and Design", McGraw-Hill Book Company.
2. Braja M. Das, "Principles of Foundation engineering", PWS Publishing Company.
3. V.N.S. Murthy, "Advanced Foundation Engineering", CBS Publishers and Distributors.