Year & Sem	Course Code: CE4509	Course Name: **Advanced Foundation Engineering**	No. of Credits: 4	L	T&PS	P
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UNIT –I :Soil exploration:
Analysis and interpretation of soil exploration data, estimation of soil parameters for foundation design.

UNIT –II:Shallow Foundations:
Methods for bearing capacity estimation, total and differential settlements of footing and raft, code provisions. Desi$_g$n of individual footings, strip footing, combined footing, rigid and flexible mat, buoyancy raft, basement raft, underpinning.

UNIT –III: Pile Foundations:
Estimation load carrying capacity of single and pile group under various loading conditions. Pile load testing (static, dynamic methods and data interpretation), settlement of pile foundation, code provisions, design of single pile and pile groups, and pile caps. Well Foundations: Types, components, construction methods, design methods (Terzaghi, IS and IRC approaches), check for stability, base pressure, side pressure and deflection.

UNIT –IV:Retaining Walls:
Types (types of flexible and rigid earth retention systems: counter fort, gravity, diaphragm walls, sheet pile walls, soldier piles and lagging). Support systems for flexible retaining walls (struts, anchoring), construction methods, stability calculations, design of flexible and rigid retaining walls, design of cantilever and anchored sheet pile walls.

UNIT –V:Soil-Foundation Interaction:
Idealized soil, foundation and interface behavior. Elastic models of soil behavior; Elastic-plastic and time dependent behavior of soil. Beams and plates on elastic foundation; numerical analysis of beams and plates resting on elastic foundation.

UNIT –VI :Reinforced Earth:
Geotechnical properties of reinforced soil, shallow foundation on soil with reinforcement, retaining walls with reinforcements, design considerations.

References/Text Books:
1. A.P.S. Selvadurai, "Elastic Analysis of Soil-Foundation Interaction", Elsevier Scientific Publishing Company.
2. Braja M. Das, "Principles of Foundation Engineering", PWS Publishing Company.
3. Joseph Bowles, "Foundation Analysis and Design", McGraw-Hill Book Company.
4. V.N.S. Murthy, "Advanced Foundation Engineering", CBS Publishers and Distributors.

Lecture Plan: Unit-I & -II syllabus for MID-I, Unit-III & -IV syllabus for MID-II and Unit-V & -VI syllabus for MID-III examinations.

Video Lectures (Web Links):
1. http://nptel.ac.in/courses/105105039/16