GEOTECHNIQUES FOR INFRASTRUCTURE

Course Code: 15CE2113	**L**	**P**	**C**
	3	**0**	**3**

Course Outcomes: At the end of the course, the student will be able to:

CO1: Demonstrate an ability to understand the soil structure system under raft foundation.
CO2: Estimate the lateral load capacity of piles and pile groups.
CO3: Explain suitability of various foundation systems for towers and chimneys.
CO4: Justify the various alternative foundation systems on weak soils.
CO5: Analyse sheet piles and bulk heads

UNIT- I (10-Lectures)

RAFT FOUNDATIONS

Types, loads on rafts, stiffness / rigidity of soil structure system; allowable soil pressures for rafts in cohesion less & cohesive soils, calculation of bearing capacity of raft foundation.

UNIT – II (10-Lectures)

PILE FOUNDATIONS

Lateral load carrying capacity, introduction to p-y method and Evans & Dunca's methods. Effect of pile group on lateral load carrying capacity.

UNIT – III (10-Lectures)

FOUNDATIONS FOR TRANSMISSION LINE TOWERS & CHIMNEYS

Behavior of pad and chimney foundations, geotechnical design of chimney and pad foundation, geotechnical design of foundations for concrete towers and chimneys.

UNIT – IV (10-Lectures)

FOUNDATIONS ON WEAK SOILS

Soil improvement and foundation techniques for construction on weak

and compressible soils. Foundation techniques on expansive soils, estimating heave typical structural distress patterns.

UNIT – V (10-Lectures)

SHEET PILE WALLS & ANCHORED BULKHEADS

Materials used types of sheet pile walls, analysis of cantilever sheet pile walls in cohesion less & cohesive soils, stability analysis of anchored bulkheads by free & fixed earth support methods.

TEXT BOOKS:

1. Varghese, P.C., "*Foundation Engineering",* 2nd Edition, Prentice Hall of India, 2009.
2. Bowles, J.E., *"Foundation Analysis and Design",* 5th Edition, Mc-Graw Hill, 2006.
3. Dr. P. Purushotham Raj, "Soil Mechanics and Foundation Engineering", 2nd Edition, Pearson Education, 2008.

REFERENCES:

1. Dr. P. Purushotham Raj, *"Ground Improvement Techniques",* 1st Ed, Univ. Sci Press, 2006.
2. M.P. Mosely, K.Krish, *"Ground Improvement",* 1st Ed., Sponpress, 2004.
3. Swami Saran, "*Analysis and Design of substructures",* 3rd Ed., Oxford Publishers, 2006.