

RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL

New Scheme Based On AICTE Flexible Curricula

Civil Engineering, VIII-Semester

Departmental Elective CE 802(B) Foundation Engineering

UNIT 1. Selection of foundation and Sub-soil exploration/investigation: Types of foundation, Factors affecting the selection of type of foundations, Steps in choosing types of foundation based on soil condition. Objectives and planning of exploration program, methods of exploration-wash boring and rotary drilling-depth of boring, Soil samples and soil samplers-representative and undisturbed sampling, Field penetration tests: SPT, SCPT, DCPT. Introduction to geophysical methods, Bore log, report writing.

UNIT 2. Shallow Foundation: Introduction, significant depth, design criteria, modes of shear failures. Detail study of bearing capacity theories (Prandtl, Rankine, Terzaghi, Skempton, Meyerhof), Bearing capacity determination using IS Code. Settlement, components of settlement & its estimation, permissible settlement, Proportioning of footing for equal settlement, allowable bearing pressure. Bearing capacity from in-situ tests (SPT, SCPT, PLATE LOAD), Factors affecting bearing capacity, Contact pressure under rigid and flexible footings. Floating foundation.

UNIT 3. Pile foundations: Introduction, Load transfer mechanism, Types of piles and their function, Factors influencing selection of pile, their method of installation and their load carrying characteristics for cohesive and granular soils, Piles subjected to vertical loads- pile load carrying capacity from static formula, dynamic formulae (ENR and Hiley), Pile load test, Pile group: carrying capacity, efficiency and settlement. Negative skin friction.

UNIT 4. Foundations on problematic soil & Introduction to Geosynthetics: Significant characteristics of expansive and collapsible soils, footing on such soils, Problems and preventive measures. Under-reamed pile foundation-its concept, design & field installation. Introduction to geosynthetics-materials, types, functions and uses.

UNIT 5. LATERAL EARTH PRESSURE: Active, Passive and Earth pressure at rest. Rankine's theory of earth pressure, Earth pressures in layered soils, Coulomb's earth pressure theory, Culmann's graphical method.

RETAINING WALLS: Types of retaining walls- stability of retaining walls against overturning, sliding, bearing capacity and drainage from backfill. Reinforced earth retaining walls.

Reference Book:

1. Murthy, V.N.S., "Text book of Soil Mechanics and Foundation Engineering", CBS Publishers Distribution Ltd., New Delhi, 2014.
2. Arora, K.R., "Soil Mechanics and Foundation Engineering", Standard Publishers and Distributors, New Delhi, 7th Edition, 2017 (Reprint).
3. Punmia, B.C., "Soil Mechanics and Foundations", Laxmi Publications Pvt. Ltd. New Delhi, 16th Edition 2017.
4. Joseph E bowles, "Foundation Analysis and design", McGraw Hill Education, 5th Edition, 28th August 2015.

5. Shamsheer Prakash et al, "Analysis, Design of foundations and Retaining Structures" Sarita Prakashan.
6. Murthy, V.N.S., "Advanced Foundation Engineering", CBS Publishers and Distributors
7. Coduto D.P., Foundation design; principles and practices, Pearson Publication