Course Code: 13CE1129

Course Educational Objectives:

五星 Students will familiarize about the importance of carrying out soil exploration before the start of any infrastructure project.

五星 To create a strong background about the various foundation systems for various projects.

五星 To impart preliminary knowledge about the importance of well foundations and rock as a suitable foundation.

Course Outcomes:

五星 Student will be able to understand how to collect site soil information, analyse and interpret.

五星 Student will demonstrate the ability to design suitable foundation systems depending upon loads and type of soil.

五星 Students will be broadly educated about the importance of earth slope stability and the applications of earth pressure theories.

UNIT-I (10 Lectures)

SOIL EXPLORATION:
Need – Methods of Soil exploration – Boring and Sampling Methods – Field tests – Penetration Tests – Plate Load Test – Pressure Meter Test – Planning of exploration program and Preparation of Soil investigation report.

UNIT-II (14 Lectures)

EARTH SLOPE STABILITY & EARTH PRESSURE THEORIES:
different conditions. Rankine’s theory of Earth pressure – Earth pressures in layered soils – Coulomb’s Earth pressure theory, Stability of retaining wall under seismic condition.

UNIT-III  (12 Lectures)

SHALLOW FOUNDATIONS:

UNIT-IV  (14 Lectures)

DEEP FOUNDATIONS:
Types of piles – Load carrying capacity of piles based on static pile formulae – Dynamic pile formulae – Pile capacity based on empirical relations – Under-reamed piles – Uplift capacity of under-reamed piles – Pile load tests – Load carrying capacity of pile groups in sands and clays – Settlement of pile groups.

UNIT-V  (10 Lectures)

ADVANCED TOPICS:

TYPES OF WELLS:
Components of well foundation; Shapes of wells; Construction and Sinking of wells; tilts and shifts
Basics of rock mechanics – Classification and index properties of rocks, Rock strength and Failure criteria, Initial stresses in rocks and their measurement.

TEXT BOOKS:
REFERENCES:


7. Relevant IS codes, Special Publications and handbooks.

8. NPTEL Video lectures.