Course Name:
Foundation Engineering

Course Number:
20413

Credit:
3

Prerequisite:
Soil Mechanics
Corequisite:
Design of Concrete Structures I

Course Description:
The objective of this course is analysis and design of different types of shallow foundations, deep foundations, and rigid retaining walls.

Course Content (outline):

- Site investigation, boring, and soil sampling, In-situ tests, determination of soil parameters based on the in-situ tests results
- Shallow foundations, types, bearing capacity of shallow foundations under vertical, inclined, and eccentric loads, bearing capacity for foundations on slopes and layered soils with/without effect of ground water surface
- Foundation settlement, elastic and consolidation settlements, foundations on problematic soils
- Design of shallow foundations (spread footings, strip foundations, mat foundations) based on rigid method and elastic solutions
- Retaining Walls, flexible retaining elements, lateral earth pressure theories, hydrostatic and hydrodynamic pressure of pore water, analysis and design of different rigid retaining walls
- Deep foundations (piles), bearing capacity of piles using static and dynamic methods and in-situ test results, pile settlement, negative skin friction

Design of pile groups (bearing capacity and distribution of load among the piles in pile group), design of pile cap

References:

- Foundation Analysis and Design, J. E. Bowles, McGraw Hill.
- Foundation Engineering Handbook, H. Y. Fang.
- Principles of Foundation Engineering, B. M. Das, PWS-Kent publishing.
- Foundation Design and Construction, M. J. Tomlinson.
- Foundations and Earth Retaining Structures, M. Budhu, John Wiley & sons.