Course Name:
Advanced Foundation Engineering

Course Number:
20418

Credit:
3

Course Content (outline):

1. **Site Characterization**
   - 1.1 Importance of Site Characterization in Geotechnical Engineering
   - 1.2 Introduction to In-Situ Testing Methods (CPT, PMT, VST, PLT)
2. **Shallow Foundations**
   - 2.1 General Considerations
   - 2.2 Determination of Bearing Capacity
   - 2.3 Effect of Groundwater
   - 2.4 Bearing Capacity for Eccentrically Loaded Foundations
   - 2.5 Special Cases in Shallow Foundations (layered Soil, Foundations Near Slopes, Foundations on Rock)
   - 2.6 Allowable Bearing Capacity and Settlement
   - 2.7 Mat Foundations
3. **Sheet Pile Walls**
   - 3.1 General Considerations
   - 3.2 Cantilever Sheet Pile Walls
   - 3.3 Anchored Sheet Pile Walls
4. **Braced Cuts**
   - 4.1 Pressure Envelope for Braced Cut Design
   - 4.2 Bottom Heave in Clay Soil
5. **Design of Retaining Walls**
   - 5.1 Earthquake Effects on Retaining Walls
6. **Pile Foundations**
   - 6.1 Types of Piles
   - 6.2 Load Transfer Mechanism

6.3 Pile Load Test

6.4 Laterally Loaded Piles

6.5 Negative Skin Friction

6.6 Pile Groups

7. Drilled Shafts

7.1 Types of Drilled Shafts

7.2 Construction Procedure

7.3 Load Bearing Capacity Equations

7.4 Settlement Considerations

References:

- Bowles, J.E., (1997), "Foundation Analysis and Design", 5th ed, McGraw Hill
- Das, B.M. (2016), "Principles of Foundation Engineering", 8th ed, Cengage Learning
- Coduto, D.P. (2001), "Foundation Engineering, Principles and Practices", 2nd ed, Prentice Hall