CV4109 Advanced Foundation Engineering

[Lecture: 26 hrs ; Tutorial: 13 hrs ; Lab: 0 hr ; Pre-requisite: CV3013; Academic Unit: 3.0]

Learning Objective :

Students can expect to

- build upon knowledge acquired in CIV331
- develop deeper understanding of foundation analyses
- develop understanding of choice of design parameters
- learn about advanced topics of foundation design and analyses

Course Content :

Principles of foundation analysis: total stress analysis versus effective stress analysis, undrained and drained soil parameters. Shallow foundations: combined footings, raft foundations and floating foundations. Deep foundations: axially and laterally loaded piles, pile groups. Other considerations: rock socketed piles, negative skin friction and effect of soil movements on piles. Static and dynamic pile load test.

Course Outline :

S/N	Topic
1	Introduction and overview of foundation analyses
2	Design considerations of Shallow Foundations
3	Combined footings, raft foundations and floating foundations
4	Overview of deep foundations
5	Axial capacity and settlement of single pile and pile group
6	Rock socketed piles, negative skin friction, effects of soil movement on pile
7	Capacity and deflection of laterally loaded pile
8	Static and dynamic pile load test

Learning Outcome :

Upon completion of the course, students should be able to:

(a) determine suitable soil parameters
(b) perform geotechnical design of shallow and deep foundations
(c) understand limitations and uncertainties in geotechnical design

Textbooks :

No specific text is required since the course covers a diverse range of topics

References :

- Bowles, J.E. Foundation Analysis and Design. 5th Ed, McGraw Hill, 1996.
- Das, B.M. Principles of Foundation Engineering. 3rd Ed. PWS-Kent, Boston, 1995.
- Coduto, D.P. Foundation Design: Principles and Practices. Prentice Hall Inc., New Jersey, 1994.
- Tomlinson, M.J. Foundation Design and Construction. 7th Ed, Pearson-Prentice Hall, London, 2001.