

Geotechnical Site Investigation

Code	Credit Hours
CE-829	3-0

Course Description

The course objective is to provide sufficient knowledge to the students to undertake soil investigation/exploration as well as formulation/analysis of soil investigation reports. Course deals with practical situations and case studies so as to have realistic approach in teaching. Students will be able to apply the gained knowledge in research in the field of Soil and Site improvement. Students will be able to apply various soil improvements techniques and methods in the field

Text Book:

1. Bell, F.G (1987), Ground Engineer's Reference Book, Butter worths, London.

Reference Book:

2. Bowles, J.E., (1988), Foundation Analysis and Design, Chapter 2, McGraw Hill, New York.
3. Robertson, P. K and Mayne., P. W., Geotechnical Site Characterization, Proceedings of the first International Conference on Site Characterization - ISC 98/Atlanta/Georgia/USA/19-22 April 1998.
4. "Earth Manual" by US Department of Interior, CBS Publishers, 1998.
5. McLean, A.C. and Gribble., C.D (1985), Geology for Civil Engineers., George Allen and Unwin, London.
6. USACE (2001), EM 1110-1-1804, Geotechnical Investigations.
7. Relevant ASTM and BS Standards.
8. Geotechnical Investigations, Engineering and Design, US Army Corps of Engineers, EM 1110-1-1804, January 01, 2001
9. McLean A.C., and Gribble C.D., Geology for Civil Engineers, Second Edition, Revised by C.D. Gribble; ISBN 0-203-36215-2 Master e-book ISBN
10. Das, B.M., (2005), Fundamentals of Geotechnical Engineering, Third edition, ISBN 0-534-37114-0
11. McCarthy, D.F., (2015), Essentials of Soil Mechanics and Foundations, Basics Geotechniques, Seventh Edition, ISBN 978-93-325-4202-0
12. Coduto, D.P., (2001), Foundation Design, Principles and Practices, Second Edition, Prentice Hall, Upper Saddle River, New Jersey 07458
13. Holtz, R.D., Kovacs, W.D, (1981), An Introduction to Geotechnical Engineering, Chapters 4 and 5, Prentice Hall, New Jersey.
14. Leonard, G.A., (1962), Foundation Engineering, Chapters 4 and 12, McGraw Hill, New York.
15. Lambe, T.M., and Whitman, R.V., (1969), Soil Mechanics, John Wiley and Sons, New York.

Prerequisites:

NIL

Assessment System for Theory

Quizzes	10-15%
Assignments	5-10%
Term Project	25-30%
Mid Terms	0-10%
ESE	45-50%

Teaching Plan

Week No	Topics	Learning Outcomes
1-2	Introduction	Course Outline, objectives, teaching plan, assessment method, Introduction, Importance of Geotechnical site investigations
3-4	Planning Site Investigation	Desk study, Walkover survey, General considerations, Layout and depth of investigation.
5	Geotechnical hazards associated with site	Swelling soils, compressible soils, ancient mines/queries, collapsible soils, liquefiable soils, dissolution features etc.
6-8	Drilling methods / excavation techniques	Washboring, drilling/boring, augering, light percussion, coring, drilled shafts/pits, drilling fluids, different drilling rigs, drilling bits.
9	MID TERM EXAM	
10-12	Sampling Techniques	Representative sampling, Disturbed and Undisturbed samples, open tube samplers, piston samplers, core barrels.
13-14	In-Situ Testing	Standard Penetration Test (SPT), Cone Penetration test (CPT), Pressuremeter test, Vane shear test.
15	Geophysical Testing	Geophysical survey, Resistivity survey, Indirect methods for profiling and sounding
16	Laboratory Testing	Index properties, shear strength characteristics, permeability and compressibility.
17	Reports	Geotechnical data report, Geotechnical design report, Geoenvironmental report.
18	End Semester Exams	