

ENGR 643: Ground Improvement
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Textbook: Instructor Notes

References: Ground Improvement, Spon Press, 1st edition, Moseley and Kirsch (2004)
Guidelines on Ground Improvement for Structures and Facilities , University
Press of the Pacific, U.S. Army Corps of Engineers , 2005
Ground Control and Improvement, Wiley-Interscience, Xanthakos, Abramson
and Bruce, 1994
Soft Ground Improvement in Lowland and Other Environments, ASCE Press,
Bergado, D.T., Anderson, L.R., Miura, N., Balasubramaniam, A.S., 1996
Geotechnical Eng. Circular #.1, Dynamic Compaction, FHWA-SA-95-037, 1995
Mechanically Stabilized Earth Walls and Reinforced Soil Slopes - Design and
Construction Guidelines; by Elias, Christopher and Berg;
FHWA NHI-00-043, March 2001, 394 pages.

COURSE DESCRIPTION

The mechanisms of soil stabilization by: Mechanical methods (compaction, explosives, vibroflotation, vibroreplacement). Hydraulic methods (groundwater lowering, preloading, electro-osmosis). Physical/chemical methods (admixtures, grouting, freezing). Inclusions (geosynthetics, reinforcements).
Prerequisite: CE 343.

COURSE OBJECTIVES

The objective is to introduce the full spectrum of ground improvement methods to civil engineering students.

COURSE OUTLINE

1. Introduction and Overview of Methods
2. Dewatering
3. Dynamic Compaction
4. Preloading and Vertical drains
5. Vibrocompaction and Vibroreplacement
6. Deep Soil Mixing
7. Grouting
8. Other Methods:
 - a. Blasting
 - b. Heating
 - c. Freezing
 - d. Electrokinetic stabilization
9. Reinforced Earth:
 - a. Geosynthetics
 - b. Soil nailing
 - c. MSE walls
 - d. Other