

## Course syllabus

Department of Civil Engineering, Indian Institute of Technology Madras

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### CE3510 - Ground Improvement

**Credit Distribution:** C:9 L:3 T:0 P:0 E:0 O:6 TH:0

**Course Type:** Theory

**Description:** To study the problems associated with weak soil deposits and the methods for their improvement, to support buildings and various types of structures.

**Course Content:** Properties of weak soils like soft clay and loose sand. Problems associated with weak deposits; Requirements of ground improvement; Methods of ground improvement like stone column, compaction piles, dynamic compaction, vertical drains and preloading; Chemical Stabilisation; Deep explosion; Use of geo textile and modern materials; Control of improvement; Field instrumentation; Design and analysis of bearing capacity and settlement of improved deposits.

#### Text Books

- Foundation Analysis and Design, McGraw-Hill International Edition, Singapore, Bowels, J.E. , 1988.
- Principles of Foundation Engineering, 8th edition, PWS Publishing, USA, Das, B.M, 2014.
- "Principles of Ground Improvement Methods", John Wiley & sons, USA, Jie Han, 2015.
- Engineering Principles of Ground Modification, McGraw-Hill International Editions, Haussmann, M.R. , 1990.
- Soil Improvement and Ground Modification Methods, Elsevier Inc., USA, Nicholson P.G. , 2015.

#### Reference Books

- Geotechnical Engineering: Saturated and Unsaturated Soils, John Wiley Sons, Briaud J.-L. , 2013.
- Foundation Engineering Handbook, Second Edition, Chapman & Hall, New York, Fang, H.Y. , 1991.
- Ground Improvement by Deep Vibratory Methods, Spon Press, Kirch K. and Kirsh F. , 2010.
- Ground Improvement, 2nd Edition, Spon Press, Moseley, M.P. and Kirsh K. , 2004.

**Prerequisite:** NIL