

Course syllabus

Department of Civil Engineering, Indian Institute of Technology Madras

CE6420 – Ground Improvement Techniques

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 problematic geomaterials and the methods for their improvement to support buildings and various types of structures.

Course Content: Engineering properties of soft, weak and compressible geomaterials; Principles of treatment; Methods of soil improvement – lime stabilization and injection, thermal, electrical and chemical methods; preloading and vertical drains; Dynamic consolidation; Granular piles; Soil nailing; Anchors; Deep mixing and Grouting; Electro-osmosis; Soil Freezing; Vacuum consolidation, Case histories.

Text Books

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

Reference Books

- Geotechnical Engineering: Saturated and Unsaturated soils, Briaud J.L, John Wiley Sons, 2013.
- Foundation Engineering Handbook, Fang H.Y, Second edition, Chapman and Hall, New York, 1991.
- Ground Improvement by Deep Vibratory Methods, Kirch K. and Kirsh F., Spon Press, 2010.
- A Guide to Ground Improvement, Mitchell J.M. and Jardine F.M, CYRIA C573, London, 2002.
- Ground Improvement, Moseley M.P and Kirsh K, 2nd edition, Spon Press, 2004.
- Soil Improvement Techniques and their Evolution, Van Impe W.F, Balkema, Rotterdam, 1989.
- Grouting and Deep Mixing, Yonekura R, Terashi M and Shibazaki M (Ed), A.A. Balkena, Rotterdam, The Netherlands, 1966.
- Ground Control and Improvement, Xanthakos P.P, Abramson L.W and Bruce D.A, John Wiley & Sons, New York, N.Y., USA,

Prerequisite: NIL