

## **CE6012 GROUND IMPROVEMENT TECHNIQUES**

### **DETAILED SYLLABUS**

#### **UNIT I PROBLEMATIC SOIL AND IMPROVEMENT TECHNIQUES**

Role of ground improvement in foundation engineering – methods of ground improvement – Geotechnical problems in alluvial, lateritic and black cotton soils – Selection of suitable ground improvement techniques based on soil conditions.

#### **UNIT II DEWATERING**

Dewatering Techniques - Well points – Vacuum and electroosmotic methods – Seepage analysis for two – dimensional flow for fully and partially penetrated slots in homogeneous deposits - Simple cases - Design.

#### **UNIT III INSITU TREATMENT OF COHESIONLESS AND COHESIVE SOILS**

Insitu densification of cohesion-less soils and consolidation of cohesive soils: Dynamic compaction Vibroflotation, Sand compaction piles and deep compaction. Consolidation: Preloading with sand drains, and fabric drains, Stone columns and Lime piles-installation techniques – simple design - relative merits of above methods and their limitations.

#### **UNIT IV EARTH REINFORCEMENT**

Concept of reinforcement – Types of reinforcement material – Reinforced earth wall – Mechanism – simple design - applications of reinforced earth. Role of Geotextiles in filtration, drainage, separation, road works and containment.

#### **UNIT V GROUT TECHNIQUES**

Types of grouts – Grouting equipments and machinery – injection methods – Grout monitoring – stabilization with cement, lime and chemicals – stabilization of expansive soil.

For Syllabus, Question Papers, Notes & many More

### **TEXTBOOKS**

1. Purushothama Raj. P, "Ground Improvement Techniques", Firewall Media, 2005.
2. Koerner, R.M. "Construction and Geotechnical Methods in Foundation Engineering", McGraw Hill, 1994.
3. Mittal.S, "An Introduction to Ground Improvement Engineering", Medtech Publisher, 2013.

### **REFERENCES**

1. Moseley, M.P., "Ground Improvement Blockie Academic and Professional", Chapman and Hall, Glasgow, 1998.
2. Jones J.E.P. "Earth Reinforcement and Soil Structure", Butterworths, London, 1985.
3. Winterkorn, H.F. and Fang, H.Y. "Foundation Engineering Hand Book". Van Nostrand Reinhold, 1994.
4. Das, B.M. – "Principles of Foundation Engineering" 7th edition, Cengage learning, 2010.
5. Coduto, D.P. "Geotechnical Engineering – Principles and Practices", Prentice Hall of India Pvt.Ltd. New Delhi, 2011.
6. Koerner, R.M. "Designing with Geosynthetics" 4th Edition, Prentice Hall, Jersey, 1999.
7. IS9759 : 1981 "Guidelines for Dewatering During Construction", Bureau of Indian Standards, New Delhi, Reaffirmed 1999
8. IS15284(Part 1) : 2003 "Design and Construction for Ground Improvement – Guidelines" (Stone Column), Bureau of Indian Standards, New Delhi, 2003.

### **OBJECTIVES**

At the end of the course student is expected to identify the problematic soil and suitable suggest remedial measures to improve their behaviour.