

Year & Sem:	Course Code: CE3602	Course Name: <b>Ground Improvement Techniques</b>	No. of Credits: 4	L	T&PS	P
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## UNIT I

**Dewatering:** methods of de-watering- sumps and interceptor ditches- single, multi stage well points - vacuum well points, Horizontal wells-foundation drains-blanket drains- criteria for selection of fill material around drains –Electro-osmosis .

**Grouting:** Objectives of grouting- grouts and their properties- grouting methods- ascending, descending and stage groutinghydraulic fracturing in soils and rocks- post grout test.

## UNIT II

### **Insitu Densification:**

In – situ densification methods in granular Soils:– Vibration at the ground surface, Impact at the Ground Surface, Vibration at depth, Impact at depth. In – situ densification methods in Cohesive soils:– preloading or dewatering, Vertical drains – Sand Drains, Sand wick, geodrains – Stone and lime columns – thermal methods.

## UNIT III

**Stabilisation:** Methods of stabilization-mechanical-cement- lime-bituminous-chemical stabilization with calcium chloride, sodium silicate and gypsum

## UNIT IV

**Reinforced Earth:** Principles – Components of reinforced earth – factors governing design of reinforced earth walls – design principles of reinforced earth walls.

## UNIT V

**Geosynthetics :** Geotextiles- Types, Functions and applications – geogrids and geomembranes – functions and applications.

## UNIT VI

**Expansive soils:** Problems of expansive soils – tests for identification – methods of determination of swell pressure. Improvement of expansive soils – Foundation techniques in expansive soils – under reamed piles.

### **References/Text Books:**

1. Hausmann M.R. (1990), Engineering Principles of Ground Modification, McGraw-Hill International Edition.
2. Purushotham Raj. Ground Improvement Techniques, Laxmi Publications, New Delhi
3. Moseley M.P. (1993) Ground Improvement, Blackie Academic and Professional, Boca Taton, Florida, USA.
4. Xanthakos P.P, Abramson, L.W and Brucwe, D.A (1994) Ground Control and Improvement, John Wiley and Sons,

**Lecture Plan:** Unit-I & -II syllabus for MID-I, Unit-III & -IV syllabus for MID-II and Unit-V & -VI syllabus for MID-III examinations.