



**BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE
(AUTONOMOUS)
DEPARTMENT OF CIVIL ENGINEERING**

REGULATION	BR23				
III B. TECH II SEMESTER	Course Code: 23CE6D01	L	T	P	C
Course Title:	GROUND IMPROVEMENT TECHNIQUES	3	0	0	3

Course Learning Objectives:

The objective of this course is:

1. To make the student appreciate the need for different ground improvement methods adopted for improving the properties of remolded and in-situ soils by adopting different techniques such as in situ densification and dewatering methods.
2. To make the student understand how the reinforced earth technology and soil nailing can obviate the problems posed by the conventional retaining walls.
3. To enable the students to know how geotextiles and geo synthetics can be used to improve the engineering performance of soils.
4. To make the student learn the concepts, purpose and effects of grouting.

Course Outcomes:

- a. By the end of the course, the student should be able to possess the knowledge of various methods of ground improvement and their suitability for different field situations.
- b. The student should be able to design are in forced earth embankment and check its stability.
- c. The student should know the various functions of Geosynthetics and their applications in Civil Engineering practice.
- d. The student should be able to understand the concepts and applications of grouting.

UNIT-I

In situ densification methods- in situ densification of granular soils- vibration at ground surface and at depth, impact at ground and at depth – insitu densification of cohesive soils – pre loading – vertical drains – sand drains and geo drains – stone columns.

UNIT-II

Dewatering–sumps and interceptor ditches –single and multi-stage well points–vacuum well points, horizontal wells – criteria for choice of filler material around drains – electro osmosis

UNIT- III

Stabilization of soils – methods of soil stabilization – mechanical – cement – lime – bitumen and polymer stabilization–use of industrial wastes like fly a Shand granulated blast furnace slag.

Dr M C S MADAN HOD & BOS, Department of Civil Engineering, BVCITS Batlapalem	Dr G Yesuratnam Professor of Civil Engineering JNTU Kakinada (University Nomine)	Dr A Murali Krishna, Professor, Department of Civil Engineering, IIT Tirupathi.	Dr B Raghuram kadali, Asst Assistant Professor, Department of civil Engineering, NIT Warangal.	Mr P Rajesh Sr Engineer(P)SDVVL Survey &Constructions, Kakinada (Industrial Expert)	Mr Chakradhar Prasad Assistant Professor, Department of civil DNR College of Engineering Technology Bhimavaram. (Alumni Member)



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Grouting – objectives of grouting – grouts and their applications – methods of grouting – stage of grouting–hydraulic fracturing in soils and rocks –post grout tests. Introduction to Liquefaction & its effects & applications.

UNIT-IV

Reinforce earth–principles–components of reinforced earth–design principles of reinforced earth walls – stability checks – soil nailing.

UNIT-V

Geosynthetics–geotextiles–types–functions, properties and applications – geogrids, geomembranes and gabions - properties and applications.

TEXT BOOKS:

1. 'Ground Improvement Techniques' by Nihar Ranjan Patro, Vikas Publishing House(p) limited, New Delhi, 1st Edition 2012.
2. 'An introduction to Soil Reinforcement and Geosynthetics' by G.L. Siva Kumar Babu, Universities Press, 22 June 2005.
3. 'Ground Improvement Techniques' by Purus Hotham Raj, Laxmi Publications, New Delhi, 1st Edition 1 January 1999.

REFERENC EBOOKS:

1. 'Ground Improvement 'by MP Moseley, Blackie Academic and Professional, USA,3rd Edition 1981.
2. 'Designing with Geosynthetics 'by RM Koerner, Prentice Hall,6th Edition 2012.

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