

23CE502 : GEOTECHNICAL ENGINEERING

Mr. L. Santhosh

Assistant Professor, Civil Engineering
Narsimha Reddy Engineering College (Autonomous)
Secunderabad, Telangana, India- 500100.



NARSIMHA REDDY ENGINEERING COLLEGE
UGC AUTONOMOUS INSTITUTION

Maisammaguda (V), Kompally - 500100, Secunderabad, Telangana State, India

UGC - Autonomous Institute
Accredited by **NBA** & **NAAC** with '**A**' Grade
Approved by **AICTE**
Permanently affiliated to **JNTUH**

Shear Strength of Soils

- • Introduction and importance in geotechnical engineering.
- • Includes theory, equations, laboratory methods and applications.
- • Suitable for B.Tech Geotechnical Engineering classroom teaching.

Importance of Shear Strength

- • Applications in foundations, slopes and retaining structures.
- • Includes theory, equations, laboratory methods and applications.
- • Suitable for B.Tech Geotechnical Engineering classroom teaching.

Mohr's Theory of Failure

- • Stress circle concept and representation.
- • Includes theory, equations, laboratory methods and applications.
- • Suitable for B.Tech Geotechnical Engineering classroom teaching.

Coulomb Failure Theory

- • Failure criterion and shear strength equation.
- • Includes theory, equations, laboratory methods and applications.
- • Suitable for B.Tech Geotechnical Engineering classroom teaching.

Mohr–Coulomb Failure Theory

- • Combined theory and engineering significance.
- • Includes theory, equations, laboratory methods and applications.
- • Suitable for B.Tech Geotechnical Engineering classroom teaching.

Shear Strength Parameters

- • Cohesion (c) and angle of internal friction (ϕ).
- • Includes theory, equations, laboratory methods and applications.
- • Suitable for B.Tech Geotechnical Engineering classroom teaching.

Laboratory Tests for Shear Strength

- • Overview of direct shear, triaxial and UCS tests.
- • Includes theory, equations, laboratory methods and applications.
- • Suitable for B.Tech Geotechnical Engineering classroom teaching.

Direct Shear Test

- • Principle, procedure and applications.
- • Includes theory, equations, laboratory methods and applications.
- • Suitable for B.Tech Geotechnical Engineering classroom teaching.

Unconfined Compression Test

- • Theory and suitability for cohesive soils.
- • Includes theory, equations, laboratory methods and applications.
- • Suitable for B.Tech Geotechnical Engineering classroom teaching.

Triaxial Compression Test

- • Apparatus, procedure and advantages.
- • Includes theory, equations, laboratory methods and applications.
- • Suitable for B.Tech Geotechnical Engineering classroom teaching.

Drainage Conditions in Shear Tests

- • Drained, undrained and consolidated-undrained conditions.
- • Includes theory, equations, laboratory methods and applications.
- • Suitable for B.Tech Geotechnical Engineering classroom teaching.

UU Test

- • Unconsolidated Undrained Test characteristics.
- • Includes theory, equations, laboratory methods and applications.
- • Suitable for B.Tech Geotechnical Engineering classroom teaching.

CU Test

- • Consolidated Undrained Test characteristics.
- • Includes theory, equations, laboratory methods and applications.
- • Suitable for B.Tech Geotechnical Engineering classroom teaching.

CD Test

- • Consolidated Drained Test characteristics.
- • Includes theory, equations, laboratory methods and applications.
- • Suitable for B.Tech Geotechnical Engineering classroom teaching.

Strength Envelopes

- • Construction and interpretation of failure envelopes.
- • Includes theory, equations, laboratory methods and applications.
- • Suitable for B.Tech Geotechnical Engineering classroom teaching.

Shear Strength of Sands

- • Factors influencing strength of cohesionless soils.
- • Includes theory, equations, laboratory methods and applications.
- • Suitable for B.Tech Geotechnical Engineering classroom teaching.

Dilatancy in Sands

- • Definition, mechanism and engineering importance.
- • Includes theory, equations, laboratory methods and applications.
- • Suitable for B.Tech Geotechnical Engineering classroom teaching.

Critical Void Ratio

- • Concept and behavior of dense and loose sands.
- • Includes theory, equations, laboratory methods and applications.
- • Suitable for B.Tech Geotechnical Engineering classroom teaching.

Introduction to Stress Path Method

- • Concept and representation of stress changes.
- • Includes theory, equations, laboratory methods and applications.
- • Suitable for B.Tech Geotechnical Engineering classroom teaching.

Summary

- • Key concepts of shear strength and stress path analysis.
- • Includes theory, equations, laboratory methods and applications.
- • Suitable for B.Tech Geotechnical Engineering classroom teaching.