

No	Information on Geotechnical Engineering I	
1.	Unit Name: Geotechnical Engineering I	
2.	Unit Code: CE- 31015	
3.	Classification : Engineering Subject	
4.	Credit Hours : 3	
	2 for lecture :(2 hours x 15 weeks)	
5.	Semester /Year Offered : 1/3	
6.	Per-requisite (if any) : Geol-31011	
7.	Mode of Delivery : Lecture , Tutorial , and Practical	
8.	Assessment System and Breakdown of Marks::	
	Tutorial	10 %
	Practical	15%
	Practical Exam	5%
	Final Examination	70 %
9.	Academic Staff Teaching Unit:	
10.	<p>Objective of Unit:</p> <p>The objective of this course is,</p> <p style="padding-left: 40px;">Civil engineering students who understand and applied the application of the soil mechanics principles in the analyses and designs of geotechnical structure.</p>	
11.	<p>Learning Outcome of Unit:</p> <p>On completion of this unit, students shall be able to:</p> <ol style="list-style-type: none"> 1. To distinguish the basic engineering properties of soil in workplace 2. To compute the basic concepts of engineering properties of soil 	
12.	<p>Synopsis of Unit:</p> <p>The unit is intended to the Origin of Soil and Grain Size, Weight-Volume Relationships, Plasticity and Structure of Soil, Classification of Soil and estimation the Soil Compaction, Permeability, Seepage and in Situ Stresses and Stresses in a Soil Mass.</p>	

13.

Topic 1 Origin of Soil and Grain Size

- Rock Cycle and the Origin of Soil
- Soil-Particle Size
- Specific Gravity (Gs)
- Mechanical Analysis of Soil
- Particle-Size Distribution Curve

Topic 2 Weight–Volume Relationships

- Introduction
- Weight–Volume Relationships
- Relationships among Unit Weight, Void Ratio, Moisture Content, and Specific Gravity
- Relationships among Unit Weight, Porosity, and Moisture Content
- Various Unit Weight Relationships
- Relative Density

Topic 3 Plasticity and Structure of Soil

- Introduction
- Liquid Limit (LL)
- Plastic Limit (PL)
- Shrinkage Limit (SL)
- Liquidity Index and Consistency Index
- Plasticity Chart

Topic 4 Classification of Soil

- AASHTO Classification System
- Unified Soil Classification System (USCS)

Topic 5 Soil Compaction

- Introduction
- Compaction—General Principles
- Standard Proctor Test

	<ul style="list-style-type: none"> • Field Compaction <p>Topic 6 Permeability</p> <ul style="list-style-type: none"> • Introduction • Bernoulli’s Equation • Darcy’s Law • Hydraulic Conductivity • Laboratory Determination of Hydraulic Conductivity <p>Topic 7 Seepage</p> <ul style="list-style-type: none"> • Introduction • Laplace’s Equation of Continuity • Continuity Equation for Solution of Simple Flow Problems • Flow Nets • Seepage through an Earth Dam on an Impervious Base <p>Topic 8 In Situ Stresses</p> <ul style="list-style-type: none"> • Introduction • Stresses in Saturated Soil • Seepage Force • Use of filter to increase the factor of safety against heave • Selection of filter material <p>Topic 9 Stresses in a Soil Mass</p> <ul style="list-style-type: none"> • Effective Stress in the Zone of Capillary Rise • The principles of estimation of vertical stress increased in soil caused by various types of loading based on the theory of elasticity
14.	<p>Main Referances:</p> <p>Text of Book ; Principles of Geotechnical Engineering</p> <p>Author ;BRAJA M.DAS .KHALED SOBHAN</p>

Edition	;Eighth Edition
Publisher	;Global Engineering Christopher M. Shortt
Other Book	
Design Aids in Soil Mechanics and Foundation Engineering	
Author	;Shenbaga R Kaniraj

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