

Session: 2020-2021

Course: B.Tech.

Department: Civil Engineering

Semester: 5TH

Subject: Soil Mechanics, PCC-CE-305-G

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LECTURE PLAN

WEEK	LECTURE	TOPIC	LAB	EXPERIMENT TITLE
1 st	1 st	Scope of Soil Mechanics, Types of Soil, Origin of Soil and its Formation, Inter-Particle Forces, Soil Structure and Fabric, Major Soil Deposits of India	1 st	Visually classify the soil and to determine the moisture content (water content) of a given soil sample
	2 nd	Three Phase System, Weight-Volume Relationships, Index Properties		
	3 rd	Three Phase System, Weight-Volume Relationships, Index Properties		
2 nd	1 st	Particle Shape and Size, Grain Size Analysis: Sieve Analysis and Hydrometer Analysis	2 nd	Determination of specific gravity of given soil sample
	2 nd	Grain Size Distribution Curves, Consistency of Soils: Sensitivity, Thixotropy, Activity		
	3 rd	Consistency Limits and their Determination		
3 rd	1 st	Numerical Problems	3 rd	To classify the coarse grained soil by sieve analysis using particle size distribution curve
	2 nd	Necessity of Classification, Classification on the Basis of Grain Size and on the Basis of Plasticity		
	3 rd	Plasticity Chart, Textural Classification, Unified Soil Classification, IS Classification System Soil		
4 th	1 st	Permeability, Darcy's Law and its Validity, Discharge Velocity and Seepage Velocity	4 th	To determine liquid limit and plastic limit
	2 nd	One Dimensional Flow, Factors Affecting Permeability		
	3 rd	Laboratory and Field Determination of Permeability, Indirect Methods, Permeability of Stratified Deposits		
5 th	1 st	Laboratory and Field Determination of Permeability, Indirect Methods, Permeability of Stratified Deposits	5 th	To determine field density of soil by Sand replacement method
	2 nd	Principle of Effective Stress, Effective Stress under Hydrostatic Conditions and Under Hydro-Dynamic Conditions		

	3 rd	Effective Stress in The Zone of Capillary Rise, Seepage Pressure, Quicksand Condition		
6 th	1 st	Seepage Through Soil: Two Dimensional Flow, Flownets	6 th	To determine field density of soil by Core Cutter Method
	2 nd	Properties and Utilities of Flownet, Uplift Pressure, Piping, Protective Filter		
	3 rd	Numerical Problems		
7 th	1 st	Definitions, Role of Moisture and Compactive Effort in Compaction, Moisture Density Relationship	7 th	To determine the optimum moisture content and maximum dry density of soil by Standard Proctor Test
	2 nd	Compaction in Laboratory and Field Conditions		
	3 rd	Compactive Effect on Soil Properties, Compaction of Cohesionless Soils		
8 th	1 st	Compactive Effect on Soil Properties, Compaction of Moderately Cohesive Soils and Clays, Field Control of Compaction	8 th	To determine the coefficient of permeability of soil sample at desired density by suitable method
	2 nd	Boussinesq's Equation, Vertical Stress Distribution Diagrams		
	3 rd	Pressure Bulb, Vertical Stress Beneath Loaded Areas, Newmark's Influence Chart		
9 th	1 st	Westergaard's Analysis, Contact Pressure,	9 th	To determine the Unconfined compressive strength of cohesive soil sample
	2 nd	Approximate Stress Distribution Methods for Loaded Areas		
	3 rd	Numerical Problems		
10 th	1 st	Consolidation Process and its Types, Components of Total Settlement	10 th	To determine the shear strength parameters of the given granular soil sample at known density and moisture content by Direct shear test
	2 nd	One-Dimensional Consolidation Test		
	3 rd	Typical Void Ratio-Pressure Relationships for Sands and Clays, Consolidation Parameters		
11 th	1 st	Normally Consolidated and Over Consolidated Clays	11 th	To determine the shear strength parameters of fine grained soil sample by unconsolidated undrained (UU) Triaxial test
	2 nd	Casagrande's Graphical Method of Estimating Pre-Consolidation Pressure		
	3 rd	Terzaghi's Theory of One- Dimensional Consolidation		
12 th	1 st	Determination of Coefficients of Consolidation, Time Rate of Consolidation	12 th	Lab Manual Check.
	2 nd	Numerical Problems		

	3 rd	Mohr Stress Circle, Mohr-Coulomb Failure-Criterion, Relationship Between Principal Stresses at Failure		
13 th	1 st	Drainage Conditions, Shear Strength Parameters and their Determination	13 th	Doubt Class
	2 nd	Advantages and Disadvantages of Different Shear Tests		
	3 rd	Shear Strength Characteristics of Clay and Sand, Partially Saturated Soils		
14 th	1 st	Types of Lateral Earth Pressure, Rankine`s Active, Passive States of Plastic Equilibrium	14 th	Doubt Class
	2 nd	Rankine`s Theory		
	3 rd	Coulomb`s Wedge Theory		
15 th	1 st	Coulomb`s Active and Passive Earth Pressure Theory	15 th	Doubt Class
	2 nd	Culmann`s Graphical Construction		
	3 rd	Numerical Problems		