

Discipline: <b>Civil Engg.</b>	Semester : <b>3rd</b>	Name of the Teaching Faculty: <b>CHITTARANJAN PANDA (LECTURER)</b>
Subject: GEOTECHNICAL ENGINEERING (Th-2)	No. of days/per week class allotted: <b>04</b>	Semester From date : 15/09/2022 To Date: 22/12/2022  No. of Weeks: 15
<b>Week</b>	<b>Class Day</b>	<b>Theory</b>
1 <sup>ST</sup>	1 <sup>st</sup>	<b>Introduction</b> Soil and Soil Engineering Scope of Soil mechanics
	2 <sup>nd</sup>	Origin and formation of soil
	3 <sup>rd</sup>	<b>Preliminary Definition and Relationship</b> Soil as a three phase system
	4 <sup>th</sup>	Water content, Density, Specific gravity, Void ratio, Porosity
2 <sup>ND</sup>	1 <sup>st</sup>	Percentage of air voids, air content, degree of saturation, density index
	2 <sup>nd</sup>	Bulk/Saturated/Dry/Submerged density, Interrelationship of various soil parameters
	3 <sup>rd</sup>	Numerical Problem
	4 <sup>th</sup>	Numerical problem
3 <sup>RD</sup>	1 <sup>st</sup>	<b>Index Properties of Soil</b> Water Content
	2 <sup>nd</sup>	Specific Gravity
	3 <sup>rd</sup>	Particle size distribution: Sieve analysis, wet mechanical analysis, particle size distribution curve and it's uses
	4 <sup>th</sup>	Consistency of Soils, Atterberg's Limit, Plasticity Index, Consistency Index, Liquidity Index
4 <sup>TH</sup>	1 <sup>st</sup>	<b>Classification of soil</b> General Classification
	2 <sup>nd</sup>	I.S. Classification
	3 <sup>rd</sup>	I.S. Classification
	4 <sup>th</sup>	Example and Numerical Problem
5 <sup>TH</sup>	1 <sup>st</sup>	Plasticity Chart
	2 <sup>nd</sup>	Example and Numerical problem
	3 <sup>rd</sup>	<b>Permeability and Seepage</b> Concept of permeability
	4 <sup>th</sup>	Darcy's Law, Co-efficient of permeability
6 <sup>TH</sup>	1 <sup>st</sup>	Factors affecting Permeability
	2 <sup>nd</sup>	Constant head permeability and falling head permeability test
	3 <sup>rd</sup>	Seepage pressure, effective stress
	4 <sup>th</sup>	Phenomenon of quick sand

7 <sup>TH</sup>	1 <sup>st</sup>	Numerical Problem
	2 <sup>nd</sup>	<b>Compaction and consolidation</b> Compaction, Light and heavy compaction test, Optimum moisture Content
	3 <sup>rd</sup>	Optimum Moisture content of soil
	4 <sup>th</sup>	-do-
8 <sup>TH</sup>	1 <sup>st</sup>	Maximum dry density, zero air void line, Factors affecting Compaction
	2 <sup>nd</sup>	Field compaction methods and their suitability
	3 <sup>rd</sup>	Consolidation
	4 <sup>th</sup>	Distinction between compaction and consolidation
9 <sup>TH</sup>	1 <sup>st</sup>	Terzaghi's model analogy of compression/ springs showing the process of consolidation- field implications
	2 <sup>nd</sup>	Terzaghi's model analogy of compression/ springs showing the process of consolidation- field implications
	3 <sup>rd</sup>	<b>Shear Strength</b> Concept of shear strength, Mohr-Coulomb failure theory
	4 <sup>th</sup>	Cohesion, Angle of internal friction
10 <sup>TH</sup>	1 <sup>st</sup>	Strength envelope for different type of soil
	2 <sup>nd</sup>	Measurement of shear strength:- Direct shear test
	3 <sup>rd</sup>	Triaxial shear test
	4 <sup>th</sup>	Unconfined compression test and vane-shear test
11 <sup>TH</sup>	1 <sup>st</sup>	<b>Earth Pressure on Retaining Structures</b> Active earth pressure
	2 <sup>nd</sup>	Passive earth Pressure
	3 <sup>rd</sup>	Earth Pressure at rest
	4 <sup>th</sup>	Use of rankine's formula for the (Cohesionless Soil) Backfill with no surcharge
12 <sup>TH</sup>	1 <sup>st</sup>	Use of rankine's formula for the (Cohesionless Soil) Backfill with no surcharge
	2 <sup>nd</sup>	Use of rankine's formula for the (Cohesionless Soil) Backfill with uniform surcharge
	3 <sup>rd</sup>	Use of rankine's formula for the (Cohesionless Soil) Backfill with uniform surcharge
	4 <sup>th</sup>	Numerical Problem
13 <sup>TH</sup>	1 <sup>st</sup>	<b>Foundation Engineering</b> Function of foundations
	2 <sup>nd</sup>	Shallow and deep foundation

	3 <sup>rd</sup>	Different types of shallow foundation with sketches
	4 <sup>th</sup>	-do-
14 <sup>TH</sup>	1 <sup>st</sup>	Different types of deep foundation with sketches
	2 <sup>nd</sup>	Different types of deep foundation with sketches
	3 <sup>rd</sup>	Types of failure General shear, Local shear & punching shear
	4 <sup>th</sup>	Bearing capacity of soil
15 <sup>TH</sup>	1 <sup>st</sup>	Bearing capacity of soils using Terzaghi's formulae
	2 <sup>nd</sup>	IS Code formulae for strip, Circular and Square footings
	3 <sup>rd</sup>	Effect of water table on bearing capacity of soil
	4 <sup>th</sup>	Plate load test & standard penetration test