

Discipline Civil Engg	Semester 3 rd	Name of the teaching faculty Mrs Tusarika Behra
Subject Geo-technical Engg	No of day/ per week class allotted 04	Semester from date 15/09/22 to date : 21/1/23 No of week 15
Week	class. day	Theory . <u>Introduction</u>
	1 st	1.1 Soil and Soil Engineering
1 st	2 nd	1.2 Scope of Soil Mechanics
	3 rd	1.3 Origin and formation of soil
		<u>2. Preliminary Definition and Relationship</u>
	4 th	2.1 Soil as a three Phase System.
2 nd	1 st	2.2 Water Content, Density Specific gravity, Voids ratio, Porosity Percentage of air voids, air content, degree of saturation, density Index, Bulk/Saturated/dry/submerged density, Interrelationship of various soil parameter
	2 nd	

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Index Properties of Soil

3 rd	3 rd	3.1 Water Content
	4 th	3.2 Specific Gravity
3 rd	1 st	3.3 Particle size distribution: Sieve analysis, wet mechanical analysis, particle size distribution curve and its uses.
	2 nd	
	3 rd	3.4 Consistency of Soils, Atterberg Limits, Plasticity Index, Consistency Index, Liquidity Index.
	4 th	

Classification of Soil

4 th	1 st	4.1 General
	2 nd	4.2 I.S. Classification, Plasticity Chart.

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		5. <u>Permeability and Seepage</u>
	3rd	5.1. Concept of Permeability Darcy's Law, Co-efficient of Permeability.
	4th	5.2. Factors affecting Permeability.
5th	1st	5.3. Constant head permeability and falling head permeability Test.
	2nd	5.4. Seepage pressure, effective stress, phenomenon of quick sand.
		6. <u>Compaction and Consolidation</u>
	3rd	6.1. <u>Compaction</u> :- Compaction, Light and heavy compaction Test, Optimum Moisture content of Soil, Maximum dry density Zero air void line, Factors affecting Compaction, Field compaction methods and their suitability.
	4th	
6th	1st	
	2nd	6.2. <u>Consolidation</u> :- Consolidation distinction between compaction and consolidation. Terzaghi's model analogy of compression

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3rd

springs showing the process of consolidation - field implications.

7. Shear Strength

4th

7.1. Concept of shear strength, Mohr-Coulomb failure theory, cohesion, Angle of internal friction, strength envelope for different type of soil, Measurement of shear strength - Direct shear test

1st

triaxial shear test, unconfined compression test and vane shear test.

2nd

3rd

4th

8. Earth Pressure on Retaining Structures

1st

8.1. Active earth pressure, Passive earth pressure, Earth pressure at rest.

8th

2nd

3rd

8.2. Use of Rankine's formula for the following case (cohesion-less soil only)

4th

- (i) Backfill with no surcharge
- (ii) Backfill with uniform surcharge

1st

9. Foundation Engineering

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9th	2nd	9.1. Function of foundations, shallow and deep foundations. different type of shallow and deep foundations with sketches. Types of failure (General. shear, Local shear & punching shear)
	3rd	
	4th	
	1st	
10th	2nd	9.2. Bearing capacity of soil, bearing capacity of soils using Terzaghi's formulae & IS code formula for strip circular and square footing. Effect water table on bearing capacity of soil.
	3rd	
	4th	
	1st	
11th	2nd	9.3. Plate load test standard penetration test.
	3rd	
	4th	
12th		Revision