LESSON PLAN OF GEOTECHNICAL ENGINEERING 3RD SEM SEC A

Deparment: Civil Engineering	**Semester : 3rd Sem SEC A**	**Name of the Teaching faculty: R.Bhanu**	
Subject :- Th1. GEOTECHNICAL ENGINEERING	**No.of Days/ week class allotted : 04/week**	**Semester from date: 15/09/2022 to 22/12/2022** **No. of Weeks :15** **Topics to be covered:-**	
Week	**Class Day**	**Topics**	**Remarks**
		1. INTRODUCTION	
1 st Week: (15 th Sept-17th Sept)	1st	1.1 Soil and soil engineering, 1.2 Scope of soil mechanics	
	2nd	1.3 Origin and formation of soil	
2nd Week : (18 th Sept-25 th Sept)		**2.PRELIMINARY DEFINATIONS AND RELATIONSHIP**	
	1st	2.1 Soil as a three phase system	
	2nd	2.2 Water content,Density, Specific gravity, void ratio, porosity, percentage of air void, air content, Degree of saturation, Density index, Bulk/Saturated/Dry/Submerged Density, Interrelationship of various soil parameter.	
	3rd	2.2 Water content,Density, Specific gravity, void ratio, porosity, percentage of air void, air content, Degree of saturation, Density index, Bulk/Saturated/Dry/Submerged Density, Interrelationship of various soil parameter.	
3 rd Week: (26 th Sept-1st Oct)	1st	2.2 Water content,Density, Specific gravity, void ratio, porosity, percentage of air void, air content, Degree of saturation, Density index, Bulk/Saturated/Dry/Submerged Density, Interrelationship of various soil parameter.	
	2nd	2.2 Water content,Density, Specific gravity, void ratio, porosity, percentage of air void, air content, Degree of saturation, Density index, Bulk/Saturated/Dry/Submerged Density, Interrelationship of various soil parameter.**3. INDEX PROPERTIES OF SOIL** - 3.1 Water Content	
		3. INDEX PROPERTIES OF SOIL	
	3rd	3.2 Specific Gravity	
4th week	**vacation**		**PUJA VACATION**

5 th Week: (10 th Oct- 15 th Oct)	1st	3.3 Particle size distribution: Sieve analysis, wet mechanical analysis, particle size distribution curve and its uses	
	2nd	3.4 Consistency of Soils, Atterberg's Limits, Plasticity Index, Consistency Index, Liquidity Index **4. Classification of Soil**- 4.1 General	
		4.Classification of Soil	
	3rd	4.2 I.S. Classification, Plasticity chart	
6 th Week: (17 th Oct- 22 nd Oct)	1st	4.2 I.S. Classification, Plasticity chart	
	2nd	4.2 I.S. Classification, Plasticity chart	
	3rd	4.2 I.S. Classification, Plasticity chart	
7 th Week: (25 th Oct- 29th Oct)		**5.Permeability and Seepage**	
	1st	5.1 Concept of Permeability, Darcy's Law, Co-efficient of Permeability,	
	2nd	5.2 Factors affecting Permeability	
	3rd	5.3 Constant head permeability and falling head permeability Test.	
8th Week: (31st oct - 5th nov)	1st	5.3 Constant head permeability and falling head permeability Test.	
	2nd	5.4 Seepage pressure, effective stress, phenomenon of quick sand	
		6.Compaction and Consolidation	
	3rd	6.1 Compaction: Compaction, Light and heavy compaction Test, Optimum MoistureContent of Soil, Maximum dry density, Zero air void line, Factors affecting Compaction, Field compaction methods and their suitability	
9 th Week: (7 th Nov -12 th Nov)	1st	6.1 Compaction: Compaction, Light and heavy compaction Test, Optimum MoistureContent of Soil, Maximum dry density, Zero air void line, Factors affecting Compaction, Field compaction methods and their suitability	
	2nd	6.1 Compaction: Compaction, Light and heavy compaction Test, Optimum MoistureContent of Soil, Maximum dry density, Zero air void line, Factors affecting Compaction, Field compaction methods and their suitability	
	3rd	6.2 Consolidation: Consolidation, distinction between compaction and consolidation, Terzaghi's model analogy of compression/ springs showing the process of consolidation – field implications	
10th Week:(14th nov - 19th nov)	1st	6.2 Consolidation: Consolidation, distinction between compaction and consolidation, Terzaghi's model analogy of compression/ springs showing the process of consolidation – field implications	

10th Week:(14th nov - 19th nov)	2nd	6.2 Consolidation: Consolidation, distinction between compaction and consolidation, Terzaghi's model analogy of compression/ springs showing the process of consolidation – field implications	
		7.Shear Strength	
	3rd	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, triaxial shear test, unconfined compression test and vane-shear test	
11 th Week: (21st Nov - 26 th Nov)	1st	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, triaxial shear test, unconfined compression test and vane-shear test	
	2nd	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, triaxial shear test, unconfined compression test and vane-shear test	
	3rd	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, triaxial shear test, unconfined compression test and vane-shear test	
12 th Week: (28 th Nov -3 rd) Dec	1st	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, triaxial shear test, unconfined compression test and vane-shear test	
		8.Earth Pressure on Retaining Structures	
	2nd	8.1 Active earth pressure, Passive earth pressure, Earth pressure at rest.	
	3rd	8.1 Active earth pressure, Passive earth pressure, Earth pressure at rest.	
13 th Week: (5 th Dec -10 th Dec)	1st	8.2 Use of Rankine's formula for the following cases (cohesion-less soil only)(i) Backfill with no surcharge, (ii) backfill with uniform surcharge	
	2nd	8.2 Use of Rankine's formula for the following cases (cohesion-less soil only)(i) Backfill with no surcharge, (ii) backfill with uniform surcharge	
	3rd	8.2 Use of Rankine's formula for the following cases (cohesion-less soil only)(i) Backfill with no surcharge, (ii) backfill with uniform surcharge	
14 th Week: (12 th Dec- 17th Dec)		**9.Foundation Engineering**	
	1st	9.1 Functions of foundations, shallow and deep foundation, different type of shallow and deep foundations with sketches. Types of failure (General shear, Local shear & punching shear)	

14 th Week: (12 th Dec- 17th Dec)	2nd	9.1 Functions of foundations, shallow and deep foundation, different type of shallow and deep foundations with sketches. Types of failure (General shear, Local shear & punching shear)	
	3rd	9.1 Functions of foundations, shallow and deep foundation, different type of shallow and deep foundations with sketches. Types of failure (General shear, Local shear & punching shear)	
15 th Week: (19 th Dec- 22nd Dec)	1st	9.1 Functions of foundations, shallow and deep foundation, different type of shallow and deep foundations with sketches. Types of failure (General shear, Local shear & punching shear)	
	2nd	9.1 Functions of foundations, shallow and deep foundation, different type of shallow and deep foundations with sketches. Types of failure (General shear, Local shear & punching shear)	
EXTRA CLASSES		9.2 Bearing capacity of soil, bearing capacity of soils using Terzaghi's formulae & IS Code formulae for strip, Circular and square footings, Effect water table on bearing capacity of soil	
		9.3 Plate load test and standard penetration test	

R. Bhanu

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