

LESSON PLAN FOR WINTER 2024

Department: Civil Engineering	Sem: 3RD Sec-A	Name of the Teaching faculty: PRAVABATI JENA	
Subject :-Th2. GEOTECHNICAL ENGINEERING	No.of Days/ week class allotted : 04/week	SEMESTER - 3RD SEM SEC A FROM DATE-01/07/2024 TO DATE- 08/11/2024 NO. OF WEEKS-19 WEEKS	
Week	Class Day	Topics	Remarks
		1. INTRODUCTION (2P)	
8th WEEK	1 ST	1.1 Soil and soil engineering, 1.2 Scope of soil mechanics	
	1 ST	1.3 Origin and formation of soil	
		2.PRELIMINARY DEFINATIONS AND RELATIONSHIP (6P)	
	2 nd	2.1 Soil as a three phase system	
	3 rd	void ratio, porosity, percentage of air void, air content, Degree of saturation, Density index, Bulk/Saturated/Dry/Submerged Density, Interrelationship of various soil	
9th WEEK	1 ST	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	
	1 ST	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	
	2 nd	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	
	3 rd	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	
		3. INDEX PROPERTIES OF SOIL (4P)	
	1 ST	3.1 Water Content	
	1 ST	3.2 Specific Gravity	

10th WEEK	2 nd	3.3 Particle size distribution: Sieve analysis, wet mechanical analysis, particle size distribution curve and its uses	
	3 rd	3.4 Consistency of Soils, Atterberg's Limits, Plasticity Index, Consistency Index, Liquidity Index	
11th WEEK		4.Classification of Soil (6P)	
	1 ST	4.1 General	
	1 ST	4.2 I.S. Classification, Plasticity chart	
	2 nd	4.2 I.S. Classification, Plasticity chart	
	3 rd	4.2 I.S. Classification, Plasticity chart	
12th WEEK	2 nd	4.2 I.S. Classification, Plasticity chart	
	3 rd	4.2 I.S. Classification, Plasticity chart	
13th WEEK		5.Permeability and Seepage (7P)	
	1 ST	5.1 Concept of Permeability, Darcy's Law, Co-efficient of Permeability,	
	1 ST	5.1 Concept of Permeability, Darcy's Law, Co-efficient of Permeability,	
	2 nd	5.2 Factors affecting Permeability	
	3 rd	5.3 Constant head permeability and falling head permeability Test.	
14th WEEK	1 ST	5.3 Constant head permeability and falling head permeability Test.	
	1 ST	5.3 Constant head permeability and falling head permeability Test.	
	3 rd	5.4 Seepage pressure, effective stress, phenomenon of quick sand	
15th WEEK		HOLIDAY	PUJA VACATION
		6.Compaction and Consolidation (8P)	
	1 ST	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	

16th WEEK	1 ST	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	
	3 rd	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	
17th WEEK	1 ST	6.2 Consolidation: Consolidation, distinction between compaction and consolidation, Terzaghi's model analogy of compression/ springs showing the process of consolidation – field implications	
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	2 nd	6.2 Consolidation: Consolidation, distinction between compaction and consolidation, Terzaghi's model analogy of compression/ springs showing the process of consolidation – field implications	
	3 rd	6.2 Consolidation: Consolidation, distinction between compaction and consolidation, Terzaghi's model analogy of compression/	
	1 ST	6.2 Consolidation: Consolidation, distinction between compaction and consolidation, Terzaghi's model analogy of compression/	
		7.Shear Strength (6P)	

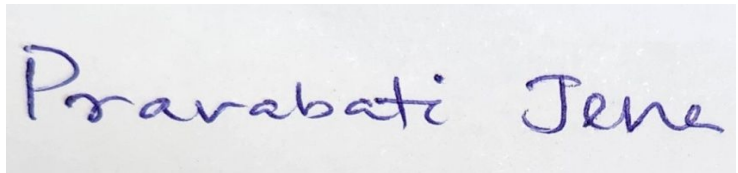
18th WEEK	1 ST	7.1 Concept of shear strength, Mohr-Coulomb failure theory, Cohesion, Angle of internal friction, strength envelope for different type of soil, Measurement of shear strength;- Direct shear test, triaxial	
	2 nd	7.1 Concept of shear strength, Mohr-Coulomb failure theory, Cohesion, Angle of internal friction, strength envelope for different type of soil, Measurement of shear strength;- Direct shear test, triaxial shear test, unconfined compression test	
	3 rd	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	
19th WEEK	1 ST	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	
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	2 nd	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 (7P)	
	3 rd	8.1 Active earth pressure, Passive earth pressure, Earth pressure at rest.	
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	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	
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	9.Foundation Engineering (14P)	
	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)	
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EXTRA CLASS

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	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	
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	9.3 Plate load test and standard penetration test	
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