LESSON PLAN FOR WINTER 2023			
Deparment: Civil Engineering	Sem: 3RD Sec-B	Name of the Teaching faculty: ARPITA ROUT	
Subject :- Th1. GEOTECHNICAL ENGINEERING	No.of Days/ week class allotted : 04/week	SEMESTER - 3RD SEM SEC B FROM DATE-1/08/2023 TO DATE- 30/11/2023 NO. OF WEEKS-18 WEEKS	
Week	**Class Day**	**Topics**	**Remarks**
		1. INTRODUCTION (2P)	
1ST WEEK	2nd	1.1 Soil and soil engineering, 1.2 Scope of soil mechanics	
	3rd	1.3 Origin and formation of soil	
		2.PRELIMINARY DEFINATIONS AND RELATIONSHIP (6P)	
	4th	2.1 Soil as a three phase system	
2nd WEEK	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.	
	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.	
	4th	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 WEEK	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.	
		3. INDEX PROPERTIES OF SOIL (4P)	
	2nd	3.1 Water Content	
	3rd	3.2 Specific Gravity	
	4th	3.3 Particle size distribution: Sieve analysis, wet mechanical analysis, particle size distribution curve and its uses	
4th WEEK	1ST	3.4 Consistency of Soils, Atterberg's Limits, Plasticity Index, Consistency Index, Liquidity Index	
		4.Classification of Soil (6P)	
	2nd	4.1 General	
	3rd	4.2 I.S. Classification, Plasticity chart	

	4th	4.2 I.S. Classification, Plasticity chart	
5th WEEK	1ST	4.2 I.S. Classification, Plasticity chart	
	3rd	4.2 I.S. Classification, Plasticity chart	
	4th	4.2 I.S. Classification, Plasticity chart	
		5.Permeability and Seepage (7P)	
6th WEEK	1ST	5.1 Concept of Permeability, Darcy's Law, Co-efficient of Permeability,	
	3rd	5.1 Concept of Permeability, Darcy's Law, Co-efficient of Permeability,	
	4th	5.2 Factors affecting Permeability	
7th WEEK	1ST	5.3 Constant head permeability and falling head permeability Test.	
	2nd	5.3 Constant head permeability and falling head permeability Test.	
	3rd	5.3 Constant head permeability and falling head permeability Test.	
	4th	5.4 Seepage pressure, effective stress, phenomenon of quick sand	
8th WEEK		**6.Compaction and Consolidation (8P)**	
	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	
	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	
	4th	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	
9th WEEK	1ST	6.2 Consolidation: Consolidation, distinction between compaction and consolidation, Terzaghi's model analogy of compression/ springs showing the process of consolidation – field implications	
	2nd	6.2 Consolidation: Consolidation, distinction between compaction and consolidation, Terzaghi's model analogy of compression/ springs showing the process of consolidation – field implications	
	3rd	6.2 Consolidation: Consolidation, distinction between compaction and consolidation, Terzaghi's model analogy of compression/ springs showing the process of consolidation – field implications	
	4th	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	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 (6P)	
	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	
	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, triaxial shear test, unconfined compression test and vane-shear test	
11th WEEK	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	
	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, triaxial shear test, unconfined compression test and vane-shear test	
12th WEEK		**8.Earth Pressure on Retaining Structures (7P)**	
	1ST	8.1 Active earth pressure, Passive earth pressure, Earth pressure at rest.	
	2nd	8.1 Active earth pressure, Passive earth pressure, Earth pressure at rest.	
	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	
13th WEEK		**VACATION**	

14th WEEK	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	
	4th	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	
15th WEEK		**9.Foundation Engineering (14P)**	
	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)	
	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)	
	4th	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)	
16th WEEK	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	9.2 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	
	3rd	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	
	4th	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	
	1ST	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	

17th WEEK	2nd	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	
	3rd	9.3 Plate load test and standard penetration test	
	4th	9.3 Plate load test and standard penetration test	
18th WEEK	2nd	9.3 Plate load test and standard penetration test	
	3rd	9.3 Plate load test and standard penetration test	

Asmita Paul
01/08/23
SIGNATURE OF THE FACULTY