

Lesson Plan:

(4 periods per week, total 60 periods in SEM)

Discipline : civil engineering	Sem.: 3rd	Name of teaching faculty: Ganesh Pradhan (PTGF)	
Sub: geotechnical engineering	No. of days/pe r week class allotted: 4	Sem. From date: 01-08-2023	To date:
		No. of weeks: 15	
Week	Class Day	Topics	
1. Introduction			
1 ST	1 ST	1.1 Soil and Soil Engineering	
	2 ND	1.2 Scope of Soil Mechanics 1.3 Origin and formation of soil	
	2. Preliminary Definitions and Relationship		
	3 RD	2.1 Soil as a three Phase system	
	4 TH	2.2 Water Content, Density, Specific gravity	
2 ND	1 ST	Voids ratio, Porosity, Percentage of air voids,	
	2 ND	air content, degree of saturation, density Index,	
	3 RD	Bulk/Saturated/dry/submerged density,	
	4 TH	Interrelationship of various soil parameters	
3. Index Properties of Soil			
3 RD	1 ST	3.1 Water Content	
	2 ND	3.2 Specific Gravity	
	3 RD	3.3 Particle size distribution: Sieve analysis, wet mechanical analysis, particle size distribution curve and its uses	
	4 TH	3.4 Consistency of Soils, Atterberg's Limits, Plasticity Index, Consistency Index, Liquidity Index	
4. Classification of Soil			
4 TH	1 ST	4.1 General 4.2 I.S. Classification	
	2 ND	4.2 I.S. Classification, Plasticity chart	
	3 RD	4.2 I.S. Classification, Plasticity chart	
	4 TH	4.2 I.S. Classification, Plasticity chart	
5 TH	1 ST	4.2 I.S. Classification, Plasticity chart	

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	2 ND	1.2 I.S. Classification, Plasticity chart
2 Permeability and Seepage		
	3 RD	5.1 Concept of Permeability, Darcy's Law, Co-efficient of Permeability,
	4 TH	5.2 Factors affecting Permeability.
6 TH	1 ST	5.2 Factors affecting Permeability.
	2 ND	5.3 Constant head permeability and falling head permeability Test.
	3 RD	5.4 Seepage pressure, effective stress, phenomenon of quick sand
	4 TH	5.4 Seepage pressure, effective stress, phenomenon of quick sand
7 TH	1 ST	phenomenon of quick sand
3. Compaction and Consolidation		
	2 ND	6.1 Compaction: Compaction, Light and heavy compaction Test,
	3 RD	Optimum Moisture Content of Soil
	4 TH	Maximum dry density, Zero air void line,
8 TH	1 ST	Factors affecting Compaction,
	2 ND	Field compaction methods and their suitability
	3 RD	6.2 Consolidation: Consolidation, distinction between compaction and consolidation.
	4 TH	Terzaghi's model analogy of compression/ springs showing the process of consolidation – field implications
9 TH	1 ST	Terzaghi's model analogy of compression/ springs showing the process of consolidation – field implications
4. Shear Strength		
	2 ND	7.1 Concept of shear strength, Mohr- Coulomb failure theory
	3 RD	Cohesion, Angle of internal friction,
	4 TH	strength envelope for different type of soil,
10 TH	1 ST	Measurement of shear strength,- Direct shear test, triaxial shear test, unconfined compression test and vane-shear test
	2 ND	Measurement of shear strength,- Direct shear test, triaxial shear test, unconfined compression test and vane-shear test
	3 RD	Measurement of shear strength,- Direct shear test, triaxial shear test, unconfined compression test and vane-shear test
5. Earth Pressure on Retaining Structures		
	4 TH	Active earth pressure, ,
11 TH	1 ST	Passive earth pressure

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	2 ND	Earth pressure at rest.
	3 RD	Use of Rankine's formula for the following cases (cohesion-less soil only) (i) Backfill with no surcharge,
	4 TH	Use of Rankine's formula for the following cases (cohesion-less soil only) (i) Backfill with no surcharge,
12 TH	1 ST	Use of Rankine's formula for the following cases (cohesion-less soil only) (ii) backfill with uniform surcharge
	2 ND	Use of Rankine's formula for the following cases (cohesion-less soil only) (ii) backfill with uniform surcharge
6. Foundation Engineering		
	3 RD	9.1 Functions of foundations, shallow and deep foundation,
	4 TH	different type of shallow foundation with sketches.
13 TH	1 ST	different type deep foundations with sketches.
	2 ND	Types of failure (General shear, Local shear & punching shear)
	3 RD	Types of failure (General shear, Local shear & punching shear)
	4 TH	9.2 Bearing capacity of soil,
14 TH	1 ST	9.2 Bearing capacity of soil,
	2 ND	bearing capacity of soils using Terzaghi's formulae
	3 RD	bearing capacity of soils using Terzaghi's formulae
	4 TH	IS Code formulae for strip, Circular and square footings
15 TH	1 ST	IS Code formulae for strip, Circular and square footings
	2 ND	water table on bearing capacity of soil
	3 RD	9.3 Plate load test
	4 TH	standard penetration test


Faculty signature


HOD,
Civil Engineering

Principal
Govt. Polytechnic Malkangiri