LESSON PLAN

Discipline:　　　　Civil Engg. ,UGMIT Rayagada

Semester:　　　　3RD

Subject:　　　　GEOTECHNICAL ENGINEERING (TH-2)

Class allotted:　　4P/week

Session:　　　　2022 Winter

Week	Class Day	Theory	Remarks
1	1-4	1. Introduction 1.1 Soil and Soil Engineering 1.2 Scope of Soil Mechanics 1.3 Origin and formation of soil 2. Preliminary Definitions and Relationship 2.1 Soil as a three Phase system.	
2	5-8	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 parameters	
3	9-12	3. Index Properties of Soil 3.1 Water Content 3.2 Specific Gravity 3.3 Particle size distribution: Sieve analysis, wet mechanical analysis, particle size distribution curve and its uses 3.4 Consistency of Soils, Atterberg's Limits, Plasticity Index, Consistency Index, Liquidity Index	
4	13-16	4. Classification of Soil 4.1 General 4.2 I.S. Classification,	
5	17-20	4.2 Plasticity chart 5. Permeability and Seepage 5.1 Concept of Permeability, Darcy's Law, Co-efficient of Permeability,	
6	21-24	5.2 Factors affecting Permeability. 5.3 Constant head permeability and falling head permeability Test.	
7	25-28	5.4 Seepage pressure, effective stress, phenomenon of quick sand 6. Compaction and Consolidation 6.1 Compaction: Compaction, Light and heavy compaction Test, Optimum Moisture Content of Soil, Maximum dry density, Zero air void line, Factors affecting Compaction,	
8	29-32	Field compaction methods and their suitability 6.2 Consolidation: Consolidation, distinction between compaction and consolidation. Terzaghi's model analogy of compression/ springs showing the process of consolidation –	
9	33-36	field implications 7. Shear Strength 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	
10	37-40	- Direct shear test, triaxial shear test, unconfined compression test and vane-shear test 8. Earth Pressure on Retaining Structures 8.1 Active earth pressure,	
11	41-44	Passive earth pressure, Earth pressure at rest. 8.2 Use of Rankine's formula for the following cases (cohesion-less soil only) (i) Backfill with no surcharge,	
12	45-48	(ii) backfill with uniform surcharge 9. Foundation Engineering 9.1 Functions of foundations, shallow and deep foundation, different type of shallow and deep foundations with sketches	
13	49-52	Types of failure (General shear, Local shear & punching shear) 9.2 Bearing capacity of soil, bearing capacity of soils using Terzaghi's formulae for strip, Circular and square footings,	
14	53-56	bearing capacity of soils using IS Code formulae for strip, Circular and square footings	
15	57-60	Effect water table on bearing capacity of soil 9.3 Plate load test and standard penetration test	

Signature of Faculty: Surya Ranjan Mahoopna
16/09/22

Signature of HOD: Manas Ranjan Pradhan
16/9/2022