LESSON PLAN

DEPARTMENT OF CIVIL ENGINEERING, ITT, CHOUDWAR

SUBJECT: GEOTECH Periods: 4 per week SEMESTER: 3rd

NAME OF FACULTY: Lalima P.Behura ACADEMIC YEAR.2022-2023

Semester From date: 15/09/2022 To Date: 22/12/2022 No. of weeks: 15

Week	Class Day	Theory / Practical Topics
1st	1st	1.Introduction Soil and Soil Engineering, Scope of Soil Mechanics, Origin and formation of soil.
	2nd	2. Preliminary Definitions and Relationship Soil as a three Phase system. Water Content, Density, Specific gravity, Voids ratio, Porosity,
2nd	1st	Percentage of air voids, air content, degree of saturation, density Index
	2nd	Bulk/Saturated/dry/submerged density , Interrelationship of various soil parameters
3rd	1st	3.Index Properties of Soil Water Content , Specific Gravity, Particle size distribution: Sieve analysis, wet mechanical analysis
	2nd	particle size distribution curve and its uses , Consistency of Soils, Atterberg's Limits, Plasticity Index, Consistency Index, Liquidity Index
4th	1st	4.Classification of Soil General
	2nd	I.S. Classification
5th	1st	Plasticity chart
	2nd	5.Permeability and Seepage Concept of Permeability, Darcy's Law, Co-efficient of Permeability,
6th	1st	Factors affecting Permeability.Constant head permeability and falling head permeability Test.
	2nd	Seepage pressure, effective stress,
7th	1st	phenomenon of quick sand 6. Compaction and Consolidation Compaction: Compaction, Light and heavy compaction Test,
	2nd	Optimum Moisture Content of Soil, Maximum dry density, Zero air void line, Factors affecting Compaction,

8th	1st	Field compaction methods and their suitability
	2nd	Consolidation: Consolidation, distinction between compaction and consolidation.
9th	1st	Terzaghi's model analogy of compression/ springs showing the process of consolidation – field implications
	2nd	7. Shear Strength Concept of shear strength, Mohr- Coulomb failure theory, Cohesion
10th	1st	Angle of internal friction, strength envelope for different type of soil,
	2nd	Measurement of shear strength;- Direct shear test, triaxial shear test, unconfined compression test and vane-shear test
11th	1st	8. Earth Pressure on Retaining Structures Active earth pressure,
	2nd	Passive earth pressure, Earth pressure at rest.
12th	1st	Use of Rankine's formula for the following cases (cohesion-less soil only) (i) Backfill with no surcharge, (ii) backfill with uniform surcharge
	2nd	9. Foundation Engineering Functions of foundations, shallow and deep foundation, different type of shallow and deep foundations with sketches
13th	1st	Types of failure (General shear, Local shear & punching shear)
	2nd	Bearing capacity of soil, bearing capacity of soils using Terzaghi's formulae & IS Code formulae for strip, Circular and square footings
14th	1st	Bearing capacity of soil, bearing capacity of soils using Terzaghi's formulae & IS Code formulae for strip, Circular and square footings
	2nd	Effect water table on bearing capacity of soil
15th	1st	Plate load test
	2nd	standard penetration test