

LESSON PLAN

Discipline: Civil Engg., UGMITRayagada

Semester: 3RD

Name of the Teaching Faculty:

Subject: **GEOTECHNICAL ENGINEERING(Th.2)**

No of Periods/week class allotted:04

Session: 2020-21

Week	Class Day	Theory/Practical Topics	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	5-8	2 PRELIMINARY DEFINITIONS AND RELATIONSHIP 2.1 Soil as a three Phase system. 2.2 Water Content, Density, Specific gravity, Voids ratio, Porosity, Percentage of air voids, air content, degree of saturation, density Index,	
3	9-12	2.2 Bulk/Saturated/dry/submerged density, Interrelationship of various soil parameters 3 INDEX PROPERTIES OF SOIL 3.1 Water Content 3.2 Specific Gravity 3.3 Particle size distribution: Sieve analysis, wet mechanical analysis, particlesize distribution curve and its uses	
4	13-16	3.4 Consistency of Soils, Atterberg's Limits, Plasticity Index, Consistency Index, Liquidity Index 4 CLASSIFICATION OF SOIL 4.1 General	
5	17-20	4.2 I.S. Classification, Plasticity chart	
6	21-24	5 PERMEABILITY AND SEEPAGE 5.1 Concept of Permeability, Darcy's Law, Co-efficient of Permeability, 5.2 Factors affecting Permeability.	
7	25-28	5.3 Constant head permeability and falling head permeability Test. 5.4 Seepage pressure, effective stress, phenomenon of quick sand	
8	29-32	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,	

		Field compaction methods and their suitability	
9	33-36	6.2 Consolidation: Consolidation, distinction between compaction and consolidation. Terzaghi's model analogy of compression/ springs showing the process of consolidation – field implications	
10	37-40	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	
11	41-44	Measurement of shear strength; - Direct shear test, triaxial shear test, unconfined compression test and vane-shear test	
12	45-48	8 EARTH PRESSURE ON RETAINING STRUCTURES 8.1 Active earth pressure, Passive earth pressure, Earth pressure at rest.	
13	49-52	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	
14	53-56	9 FOUNDATION ENGINEERING 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)	
15	57-60	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 9.3 Plate load test and standard penetration test	

Signature of Faculty:

Signature of HOD: