

<b>PROGRAMME : CIVIL ENGINEERING</b> <b>COURSE NAME : GEOTECHNICAL ENGG.</b> <b>COURSE CODE : TH-2</b> <b>SEMESTER : 3<sup>RD</sup></b> <b>PERIODS/WEEK: 4</b> <b>TOTAL PERIODS: 60</b>		<b>NAME OF THE FACULTY: UTKALIKA PRADHAN</b> <b>SESSION : 2020-2021</b> <b>DATE : 01-09-2020 To 19-03-2021</b>
WEEK	CLASS	TOPICS
1	1	Introduction: Soil and Soil Engineering Scope of Soil Mechanics
	2	Origin and formation of soil
	3	Soil as a three Phase system: Phase diagram
	4	Weight volume relationship of soil
2	1	Preliminary Definitions: Water Content, Density, Specific gravity, density Index, Bulk/Saturated/dry/submerged density
	2	Voids ratio, Porosity, Percentage of air voids, air content, degree of saturation
	3	Interrelationship of various soil parameters
	4	Numerical problems on interrelationship of soil parameters
3	1	Determination of Water content: Oven drying method & Pycnometer method
	2	Determination of specific gravity by pycnometer method
	3	Particle size distribution: Sieve analysis, wet mechanical analysis
	4	Particle size distribution curve and its uses
4	1	Consistency of Soils, Atterberg's Limits, Plasticity Index, Consistency Index, Liquidity Index
	2	I.S. Classification of soil
	3	Plasticity chart: Explanation & numerical problems
	4	Permeability: Concept, Darcy's Law, Co-efficient of Permeability
5	1	Factors affecting Permeability
	2	Constant head permeability test: Explanation & numerical problems
	3	Falling head permeability test: Explanation & numerical problems
	4	Seepage pressure, effective stress, phenomenon of quick sand
6	1	Compaction: Definition & Concept,
	2	Light and heavy compaction Test: Proctor test
	3	Optimum Moisture Content of Soil, Maximum dry density, Zero air void line
	4	Factors affecting Compaction
7	1	Field compaction methods and their suitability
	2	Consolidation: Definition & concept, distinction between compaction and consolidation.
	3	Terzaghi's model analogy of compression/ springs showing the process of consolidation
	4	Field application of Spring analogy
8	1	Concept of shear strength
	2	Mohr- Coulomb failure theory
	3	Cohesion, Angle of internal friction, strength envelope for different type of soil
	4	Direct shear test: description
9	1	Tri-axial shear test: description
	2	Unconfined compression test and vane-shear test
	3	Earth Pressure on Retaining Structures: concept

	4	Plastic Equilibrium of soil
10	1	Active earth pressure: details
	2	Passive earth pressure, Earth pressure at rest.
	3	Use of Rankine's formula: Backfill with no surcharge
	4	Use of Rankine's formula: Backfill with uniform surcharge
11	1	Foundation Engineering: Definition, Function of foundations
	2	Types of foundation: Shallow & Deep foundations
	3	Different type of shallow foundations with sketches.
	4	Different type of deep foundations with sketches.
12	1	Types of failure (General shear, Local shear & punching shear)
	2	Bearing capacity of soil: Definition & concept
	3	Bearing capacity of soils using Terzaghi's formulae for strip, Circular and square footings,
	4	Numerical problems on Terzaghi's formulae
13	1	Bearing capacity of soils using IS Code formulae for strip, Circular and square footings,
	2	Numerical problems on IS Code formulae
	3	Effect water table on bearing capacity of soil
	4	Plate load test and standard penetration test
14	1	Revision of chapter-1 & 2
	2	Revision of chapter-3 & 4
	3	Revision of chapter-5 & 6
	4	Revision of chapter-7 & 8
15	1	Revision of chapter-9
	2	Probable questions discussion
	3	Probable questions discussion
	4	Probable questions discussion