PADMASHREE KRUTARTHA ACHARYA INSTITUTE OF ENGINEERING & TECHNOLOGY, BARGARH

LESSON PLAN

Session-2023-2024

Discipline: Civil Engineering Engg. Semester: 3rd

Subject: Geotechnical Engineering

Name of the Teaching Faculty: Bikramaditya Bagh

Subject: Geotechnical Engineering No. of Days/per week class allotted 4

Semester From Date : ~~01.08.2023~~ To Date : 30.11.2023 No. of Weeks : 15

Week	Class Day	Theory /Practical Topics
1st	1st	Introduction Soil and soil Engineering scope of soil Mechanics
	2nd	origin and formation of soil
	3rd	Preliminary Definition and Relationship Soil as a three phase system
	4th	water content, Density specific gravity
2nd	1st	void ratio, porosity, percentage of air voids air content
	2nd	degree of saturation, density index
	3rd	Bulk/saturated/dry/ submerged density
	4th	Interrelationship of various soil parameters
3	1st	Index Properties of soil water content, specific gravity
	2nd	particle size distribution Sieve Analysis
	3rd	Wet mechanical analysis, particle size distribution curve and its uses
	4th	Consistency of soils. Atterberg's limit, plasticity index, consistency index, liquidity index

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4	1st	classification of soil General classification
	2nd	I.S. classification
	3rd	I.S. classification
	4th	General classification
5	1st	plasticity chart
	2nd	plasticity chart
	3rd	Permeability and seepage concept of permeability, Darcy's law
	4th	coefficient of permeability
6	1st	Factors affecting permeability
	2nd	constant head permeability test
	3rd	falling head permeability test
	4th	seepage pressure, effective stress

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Week	Class Day	Theory /Practical Topics
7	1st	phenomenon of quick sand
	2nd	compaction and consolidation compaction, Light and heavy compaction test
	3rd	optimum moisture content of soil, maximum dry density
	4th	zero air void line, Factors affecting compaction
8	1st	Field compaction methods and their suitability
	2nd	consolidation
	3rd	distinction between compaction and consolidation
	4th	Terzaghi's model analogy of compression
9	1st	Spring showing the process of consolidation field implications
	2nd	Shear strength concept of shear strength
	3rd	Mohr-coulomb failure theory
	4th	cohesion, Angle of internal friction

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Week	Class Day	Theory /Practical Topics
10	1st	Strength envelope for different types of soil
	2nd	Measurement of shear strength Direct shear test, triaxial shear test
	3rd	unconfined compression test Vane shear test
	4th	Earth pressure on retaining structures Active earth pressure
11	1st	Active earth pressure
	2nd	passive earth pressure
	3rd	Earth pressure at rest
	4th	Use of Rankine's formula Backfill with no surcharge in cohesionless soil
12	1st	backfill with uniform surcharge in cohesionless soil
	2nd	backfill with uniform surcharge in cohesionless soil
	3rd	Foundation Engineering Functions of foundation
	4th	shallow and deep foundation

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Week	Class Day	Theory /Practical Topics
13	1st	different types of shallow foundation with sketches
	2nd	different types of deep foundation with sketches
	3rd	Type of failure general shear failure
	4th	local shear & punching shear failure
14	1st	Bearing capacity of soil
	2nd	bearing capacity of soil using Terzaghi's formulae
	3rd	IS code formula for strip
	4th	circular and square footing
15	1st	effect water table on bearing capacity of soil
	2nd	plate load test
	3rd	plate load test
	4th	Standard penetration test

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