

# PADMASHREE KRUTARTHA ACHARYA INSTITUTE OF ENGINEERING & TECHNOLOGY, BARGARH



## PROGRESS REGISTER

Session-2022-2023

Discipline: Civil Engg.

Semester: 3rd . Subject: Geotechnical Engineering

Name of the Teaching Faculty: Bikramaditya Bosh

Subject: Geotechnical Engineering No. of Days/per week class allotted 04

Semester From Date : 15/09/2022 To Date : 20/01/2023 No. of Weeks : 15

Date	Topics to be covered as per Lesson Plan	Topics actually covered	Points/contents Discussed (in brief)	Signature of Teacher
15/09/2022	Introduction Soil and soil Engineering Scope of soil mechanics	Soil, soil engineering scope of soil mechanics	different meaning of soil, soil engineering retaining structures, slope stability, Undersea and Structure Earth Dam Pavement design	<u>BdBagh</u>
16/09/2022	Origin and formation of soil	Weathering rocks decomposition of organic matter formation of soil	gravel, sand, silt, clay humal, peat, muck rock, Parent material physical & chemical weathering	<u>BdBagh</u>
19/09/2022	Preliminary Definition and Relationship soil as a three phase system	three phase, two phase soil relationship	air, water, soil fully saturated, dry condition, volume of void, volume of water	<u>BdBagh</u>
21/09/2022	Water content, Density Specific gravity	Water content, Density, specific gravity	mass of water, mass of soil, definition of density, value and definition of specific gravity	<u>BdBagh</u>
22/09/2022	Void ratio, porosity, % of air voids, air content	void ratio, porosity, % of air void, air content	definition and % of void ratio, porosity expressed, % air content definition	<u>BdBagh</u>
23/09/2022	degree of saturation, density Index	degree of saturation, density Index	definition of degree of saturation, density index formula density index bore various soil	<u>BdBagh</u>
24/09/2022	Bulk/saturated/dry / Submerged density	Bulk/saturated/dry submerged density	definition of bulk, saturated, dry, submerged density, Relative compaction,	<u>BdBagh</u>
27/09/2022	Interrelationship of various soil parameters	Various types of soil	aeolin, alluvial, various soil definition various formula in relationship	<u>BdBagh</u>
29/09/2022	Index Properties of soil Water content, specific gravity	Water content, specific gravity	Various method to determination of water content, oven drying method, specific gravity determination by pycnometer	<u>BdBagh</u>
30/09/2022	particle size distribution sieve analysis	particle size distribution curve sieve analysis	gradation curve dry sieve analysis wet sieve analyser coefficient uniformity coefficient of curvature	<u>BdBagh</u>
10/10/2022	Wet mechanical analysis particle size distribution curve and its uses	Wet mechanical analysis particle size distribution curve and its uses	pipette method, merca demerco, hydrometer method,	<u>BdBagh</u>

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12/09/2022	Consistency of soils, Atterberg limit, plasticity Index, Consistency Index, liquidity index	Atterberg's limit, liquid plastic, shrinkage limit consistency index, liquidity index	Swedish Atterberg's different state of soil liquidity index, consistency index, blow, toughness ratio numeric problem on atterberg's limit	<u>BdBasht</u>
13/10/2022	classification of soil (General classification)	classification of soil (general classification)	particle size distribution classification, Textural classification	<u>BdBasht</u>
14/10/2022	General classification	general classification	AASHTO classification system Unified soil classification system	<u>BdBasht</u>
17/10/2022	I.S. classification	I.S. classification	various symbols of coarse grained soil	<u>BdBasht</u>
19/10/2022	I.S. classification	I.S. classification	detailed description of I.S. classification and symbol of fine grained soil	<u>BdBasht</u>
20/10/2022	Plasticity chart	plasticity chart	definition of plasticity chart, U-line on graph	<u>BdBasht</u>
21/10/2022	plasticity chart	plasticity chart	numeric problem on plasticity chart	<u>BdBasht</u>
26/10/2022	permeability and seepage concept of permeability Darcy's Law	concept of permeability Darcy's law	definition of permeability valid of permeability state & derive darcy's law	<u>BdBasht</u>
27/10/2022	co-efficient of permeability	co-efficient of permeability	soil type & their co-efficient of permeability. Laboratory method constant & falling head method	<u>BdBasht</u>
28/10/2022	Factors affecting permeability	Factors affecting permeability	grain size, properties of the pore fluid, void ratio, structural arrangement, entrapped air, adsorbed water	<u>BdBasht</u>
31/10/2022	constant head permeability test	constant head permeability test	derivation formula of constant head permeability test and numerical problem solved	<u>BdBasht</u>

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02/11/2022	falling head permeability test	falling head permeability test	derive formula of falling head permeability test and numerical problem solved	<u>BdBash</u>
03/11/2022	seepage pressure, effective stress	seepage pressure, effective stress	seepage force, discharge velocity, seepage velocity, effective stress, pore pressure	<u>BdBash</u>
04/11/2022	phenomenon of quick sand	phenomenon of quick sand	derive formula of critical hydraulic gradient, numeric problem quicksand condition description	<u>BdBash</u>
07/11/2022	compaction & consolidation, compaction, light & heavy compaction test	compaction, light & heavy compaction test	definition of compaction distinguish between light & heavy compaction test	<u>BdBash</u>
09/11/2022	Optimum moisture content of soil, Maximum dry density	optimum moisture content of soil, Maximum dry density	relation and definition between optimum moisture content & maximum dry density	<u>BdBash</u>
10/11/2022	Zero air void line, Factor affecting compaction	Zero air void line factor affecting compaction	definition of saturation line, various point to be discuss on factor affecting compaction	<u>BdBash</u>
11/11/2022	Field compaction methods and their suitability	Field compaction methods and their suitability	Roller, pneumatic, tamping, vibrator, these are use in different soil	<u>BdBash</u>
14/11/2022	consolidation	consolidation	Introduction to consolidation compressibility	<u>BdBash</u>
17/11/2022	distinction between compaction and consolidation	distinction between compaction and consolidation	brief description between compaction and consolidation	<u>BdBash</u>
18/11/2022	Terzaghi's model analogy of compression	Terzaghi's model analogy of compression	Assumption in Terzaghi's Analysis.	<u>BdBash</u>
21/11/2022	spring showing the process of consolidation field implications	spring showing the process of consolidation field implication	valves open, closed case, spring load on fixed trap	<u>BdBash</u>

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23/11/2022	Shear strength concept of shear strength	concept of shear strength	introduction to shear strength.	<u>BdBagh</u>
24/11/2022	Mohr-Coulomb failure theory	Mohr-Coulomb failure theory	Coulomb created formula, and their theory statement	<u>BdBagh</u>
25/11/2022	cohesion, Angle of internal friction	cohesion, Angle of internal friction	definition cohesion & Angle of internal friction	<u>BdBagh</u>
28/11/2022	Strength envelope for different types of soil	Strength envelope for different types of soil	different state of soil and their graph discussed $LW, PW$	<u>BdBagh</u>
30/11/2022	Measurement of shear strength Direct shear test. triaxial shear test	Direct shear test triaxial shear test	direct shear test apparatus details description and triaxial shear test	<u>BdBagh</u>
01/12/2022	unconfined compression test, Vane shear test	unconfined compression test, vane shear test	compression test numeric problem, vane shear test derive formula, numeric problem	<u>BdBagh</u>
02/12/2022	Earth pressure on Retaining structures Active earth pressure	Active earth pressure	Introduction to earth pressure, surcharge derive of active earth pressure formula	<u>BdBagh</u>
03/12/2022	Active earth pressure	active earth pressure	derivation and numeric problem solve of active earth pressure	<u>BdBagh</u>
07/12/2022	passive earth pressure	passive earth pressure	derive formula of passive earth pressure, definition, numeric problem cohesionless, cohesive soil	<u>BdBagh</u>
08/12/2022	Earth pressure at rest	Earth pressure at rest	horizontal & vertical stress, numeric problem	<u>BdBagh</u>
09/12/2022	Use of Rankine's formula Backfill with no surcharge in cohesionless soil	Use of Rankine's formula Backfill with no surcharge in cohesionless soil	Rankine's earth pressure theory, assumption lateral earth pressure	<u>BdBagh</u>

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12/12/2022	backfill with uniform surcharge in cohesionless soil	backfill with uniform surcharge in cohesionless soil	equivalent height, derive formula with sketch	<u>BdBasb</u>
14/12/2022	backfill with uniform surcharge in cohesionless soil	backfill with uniform surcharge in cohesionless soil	numeric problem on retaining wall, dry, cohesionless	<u>BdBasb</u>
15/12/2022	Foundation Engineering Functions of foundation	foundation, function of foundation	definition of foundation, function of foundation, footing, foundation soil	<u>BdBasb</u>
16/12/2022	shallow and deep foundation	shallow and deep foundation	state shallow and deep foundation Types of foundation	<u>BdBasb</u>
19/12/2022	different types of shallow foundation with sketches	Foundation shallow foundation classification with sketches	grillage foundation, mat foundation, inverted arches	<u>BdBasb</u>
21/12/2022	different types of deep foundation with sketches	deep foundation, classification with sketches	Basements, Bouyancy caissons, cylinders, shaft, pile foundation	<u>BdBasb</u>
22/12/2022	Type of failure general shear failure	Types of failure general shear failure	Minimum depth of foundation, Rankine Assumption Terzaghi Analysis, general shear failure characteristics	<u>BdBasb</u>
23/12/2022	local shear & punching shear failure	local shear & punching shear failure	characteristics of local & punching shear failure with detail sketch	<u>BdBasb</u>
26/12/2022	Bearing capacity of soil	Bearing capacity of soil	various terms related bearing capacity of soil, ultimate, b.c. N.B.c.	<u>BdBasb</u>
28/12/2022	Bearing capacity of soil using Terzaghi's formulae	Bearing capacity of soil using Terzaghi's formulae	general bearing capacity equation: foundation Analysis	<u>BdBasb</u>
29/12/2022	IS code formulae for strip	IS code formulae for strip	numeric problem on strip footing	<u>BdBasb</u>

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30/12/2022	Circular and square footing	Circular and square footing	design of circular and square footing problem	<u>Bd Bach</u>
02/01/2023	effect water table on bearing capacity of soil	effect water table on bearing capacity of soil	design of foundation water table at different level	<u>Bd Bach</u>
04/01/2023	plate load test	plate load test	bearing plates, Test pit loading arrangement gravity loading methods	<u>Bd Bach</u>
05/01/2023	plate load test	plate load test	Reaction-truss method setting of plate, load increments, settlement and observations, load settlement curve and ultimate bearing capacity	<u>Bd Bach</u>
09/01/2023	standard penetration test	standard penetration test	Standard penetration test procedure, Precaution taken for SPT, Advantage Disadvantage of SPT	<u>Bd Bach</u>
11/01/2023	Revision	numeric problem on density index	solving numeric problem on density index	<u>Bd Bach</u>
12/01/2023	Revision	numeric problem on atterberg limit consistency, liquidity index	numeric problem on atterberg limit consistency liquidity index	<u>Bd Bach</u>
18/01/2023	Revision	numeric problem on three phase system	numeric problem on three phase system void ratio, porosity, mass density, water content, degree of saturation	<u>Bd Bach</u>
19/01/2023	Revision	numeric problem on shrinkage ratio	numeric problem on shrinkage limit, shrinkage ratio	<u>Bd Bach</u>
20/01/2023	Revision	numeric problem on permeability of soil	constant head & falling head permeal test problem	<u>Bd Bach</u>