

# PADMASHREE KRUTARTHA ACHARYA INSTITUTE OF ENGINEERING & TECHNOLOGY, BARGARH



## LESSON PLAN Session-2022-2023

Discipline: Civil Engineering Engg. Semester: 3<sup>rd</sup>

Name of the Teaching Faculty: Bikramaditya Bagh

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

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

Week	Class Day	Theory /Practical Topics
1	1 <sup>st</sup>	Introduction Soil and Soil Engineering Scope of soil Mechanics
	2 <sup>nd</sup>	origin and formation of soil
	3 <sup>rd</sup>	Preliminary Definition and Relationship Soil as a three phase system
	4 <sup>th</sup>	water content, Density, specific gravity
2	1 <sup>st</sup>	void ratio, porosity, percentage of air voids, air content
	2 <sup>nd</sup>	degree of saturation, density index
	3 <sup>rd</sup>	Bulk/saturated/dry/submerged density
	4 <sup>th</sup>	Interrelationship of various soil parameters
3	1 <sup>st</sup>	Index Properties of soil water content, specific gravity
	2 <sup>nd</sup>	Particle size distribution! sieve analysis
	3 <sup>rd</sup>	wet mechanical analysis, particle size distribution curve and its use
	4 <sup>th</sup>	Consistency of soils, Atterberg's Limit, plasticity Index, Consistency Index, Liquidity Index

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

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

Week	Class Day	Theory /Practical Topics
4	1 <sup>st</sup>	classification of soil General classification
	2 <sup>nd</sup>	General classification
	3 <sup>rd</sup>	I.S. classification
	4 <sup>th</sup>	I.S. classification
5	1 <sup>st</sup>	plasticity chart
	2 <sup>nd</sup>	plasticity chart
	3 <sup>rd</sup>	Permeability and Seepage concept of permeability, Darcy's Law
	4 <sup>th</sup>	coefficient of Permeability
6	1 <sup>st</sup>	factors affecting permeability
	2 <sup>nd</sup>	constant head permeability test
	3 <sup>rd</sup>	falling head permeability test
	4 <sup>th</sup>	seepage pressure, effective stress

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

Semester From Date : 15/09/2022 To Date : 25/12/2022 No. of Weeks : 15

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

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

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

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

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

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

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

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