

**JHARSUGUDA ENGINEERING SCHOOL, JHARSUGUDA
DEPARTMENT OF CIVIL ENGINEERING**

LESSON PLAN

PROGRAMME: DIPLOMA IN CIVIL ENGINEERING

SUBJECT- GEOTECHNICAL ENGG. (TH-2)

SEMESTER- 3rd

Chapter	Week No.	Class Day	Lecture No.	<u>Topic to be Covered</u>
1				INTRODUCTION TO GEOTECHNICAL ENGG.
	1st Dt- 15.09.2022	1 st	1	Soil and Soil Engineering & Scope of Soil Mechanics
		2 nd	2	Origin and formation of soil
2				PRELIMINARY DEFINITIONS AND RELATIONSHIP
	2nd	1 st	3	Soil as a three Phase system and two phase system
		2 nd	4	Water Content, Density, Specific gravity, Voids ratio, Porosity, Percentage of air voids, air content, degree of saturation

		3 rd	5	density Index, Bulk/Saturated/dry/submerged density
		4 th	6	Interrelationship of various soil parameters
	3rd	1 st	7	Interrelationship of various soil parameters and related problems
		2 nd	8	Problems on Interrelationship of various soil parameters
3				INDEX PROPERTIES OF SOIL
	3rd	3 th	9	Water Content & Specific Gravity determination process
		4 th	10	Particle size distribution: Sieve analysis, wet mechanical analysis, particle size distribution curve and its uses

		1 st	11	Consistency of Soils, Atterberg's Limits, Plasticity Index,
	4th	2 nd	12	Consistency Index, Liquidity Index and related problems.
4				CLASSIFICATION OF SOIL
	4th	3 rd		General classification of soil
			13	
		4 th		General classification of soil
			14	

	5th	1 st	15	General classification of soil
		2 nd	16	General classification of soil
		3 rd	17	General classification of soil
		4 th	18	I.S. Classification, Plasticity chart
5 & 6				PERMEABILITY AND SEEPAGE
	6th	1 st	19	Concept of Permeability
		2 nd	20	Darcy's Law, Co-efficient of Permeability related problems
		3 rd	21	Factors affecting Permeability
		4 th	22	Constant head permeability test procedure and problems

	7th	1 st	23	falling head permeability Test and problems.
		2 nd	24	Seepage pressure, effective stress, phenomenon of quick sand
		3 rd	25	Questions discussion on above topic
		4 th	26	Compaction, Light compaction Test
6	8th	COMPACTION AND CONSOLIDATION		
		1 st	27	Heavy compaction Test
		2 nd	28	Optimum Moisture Content of Soil, Maximum dry density, Zero air void line
		3 rd	29	Factors affecting Compaction, Field compaction methods and their suitability
		4 th	30	Consolidation, distinction between compaction and consolidation.


6	9th	1 st	31	Terzaghi's model analogy of compression/ springs showing the process of consolidation
		2 nd	32	field implications of compaction and consolidation
		3 rd	33	Questions discussion and problem solved
		4 th	34	Concept of shear strength

		SHEAR STRENGTH		
7	10th			
		1 st	35	Mohr- Coulomb failure theory
		2 nd	36	Cohesion, Angle of internal friction, strength envelope for different type of soil
		3 rd	37	Measurement of shear strength;- Direct shear test, triaxial shear test,
		4 th	38	Unconfined compression test and vane-shear test.

EARTH PRESSURE ON RETAINING STRUCTURES				
8				
	11th	1 st	39	Active earth pressure, Passive earth pressure, Earth pressure at rest.
		2 nd	40	Problem solved on above
		3 rd	41	Use of Rankine's formula for the following cases (cohesion-less soil only) (i) Backfill with no surcharge, (ii) backfill with uniform surcharge
		4 th	42	Problems on earth pressure
9				FOUNDATION ENGINEERING
	12	1 st	43	Functions of foundations, shallow and deep foundation
		2 nd	44	different type of shallow and deep foundations with sketches
		3 rd	45	Types of failure (General shear, Local shear & punching shear)
		4 th	46	Bearing capacity of soil, bearing capacity of soils using Terzaghi's formulae
	13	1 st	47	IS Code formulae for strip, Circular and square footings
		2 nd	48	Effect water table on bearing capacity of soil
		3 rd	49	Plate load test
		4 th	50	standard penetration test

	14	1st	51	Revision
		2 nd	52	Revision
		3 rd	53	PYQ SESSION
		4 th	54	PYQ SESSION

Manaranjan patra
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Signature of Faculty Member	Counter Signature of H.O.D.
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