GOVERNMENT POLYTECHNIC, BALANGIR

DEPARTMENT OF CIVIL ENGINEERING

LESSION PLAN

SESSION 2023-24

SUBJECT: GEOTECHNICAL ENGINEERING	BRANCH: CIVIL ENGINEERING
NAME OF THE FACULTY: ABINASH BISWAL	SEMESTER: 5 TH

SL NO.	CHAPTER	HOURS	LECTURE NO.	TOPIC TO BE COVERED
1	CHAPTER 01	02		Introduction
			1	Soil and Soil Engineering, Scope of Soil mechanics
			2	Original and formation of soil
2	CHAPTER 02	06		Preliminary Definition and Relationship
			1	Soil as a three Phase system
			2	Water content, Density, Specific gravity
			3	Void ratio, Porosity, Percentage of Air voids, Air content
			4	Degree of Saturation, Density Index
			5	Bulk/Saturated/submerged density, interrelationship of various parameters
			6	interrelationship of various parameters
3	CHAPTER 03	04		Index Properties of soil
			1	Water Content, Specific Gravity
			2	Particle size distribution: sieve analysis, wet analysis
			3	Particle size distribution curve and its use
			4	Consistency of soils, Atterberg limits, Plasticity Index, Liquidity index
4	CHAPTER 04	06		Classification of Soil
			1	General
			2	Indian standard Classification
			3	Indian standard Classification
			4	Indian standard Classification

			5	Plasticity Chart
			6	Plasticity Chart
5	CHAPTER 05	07		Permeability and Seepage
			1	Concept of Permeability, Darcy's Law
			2	Co-efficient of Permeability and Factors affecting Permeability
			3	Constant head permeability test
			4	Falling head permeability test
			5	Seepage pressure
			6	Effective stress
			7	Phenomenon of quick sand
6	CHAPTER 06	08		Compaction and Consolidation
			1	Compaction, Light Compaction test
			2	Heavy compaction test, Optimum moisture content of soil
			3	Maximum dry density, zero air void line, Factor affecting Compaction
			4	Field Compaction method and their Suitability
			5	Consolidation
			6	Distinction between compaction and Consolidation
			7	Terzaghi's model analogy of compression
			8	Spring showing the process of consolidation -Field impletions
7	CHAPTER 07	06		Shear Strength
			1	Concept of shear strength
			2	Mohr- Coulomb failure theory, Cohesion
			3	Angle of internal friction, strength envelope for different type of soi
			4	Measurement of shear strength; - Direct shear test, triaxial shear test,
			5	Measurement of shear strength; - Direct shear test, triaxial shear test,
			6	unconfined compression test and vane-shear test
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Earth Pressure on Retaining Structures Learth Pressure	0	CHAPTED 00	07	1	
2 Passive earth pressure, 3 Earth pressure at rest 4 Use of Rankine's formula for the following cases (cohesion-less soil only) 5 (i) Backfill with no surcharge 6 (ii) backfill with uniform surcharge 7 i) Backfill with no surcharge (ii) backfill with uniform surcharge Foundation Engineering 1 Functions of foundations 2 shallow and deep foundation 3 different type of shallow and deep foundations with sketches. 4 different type of shallow and deep foundations with sketches. 5 Types of failure (General shear, Local shear & punching shear) 6 Bearing capacity of soils using Terzaghi's formulae & IS Code formulae for strip 8 bearing capacity of soils using Terzaghi's formulae & IS Code formulae for strip 9 Circular and square footings 10 Circular and square footings 11 Effect water table on bearing capacity of soil	8	CHAPTER 08	07		Earth Pressure on Retaining Structures
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				11	Effect water table on bearing capacity of soil
13 Plate load test and standard penetration test				12	Effect water table on bearing capacity of soil
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14 Plate load test and standard penetration test				14	Plate load test and standard penetration test