LESSON PLAN OF 3RD SEMESTER(2024-25) CIVIL ENGINEERING

Discipline:- CIVIL ENGG.	Semester:-3RD	Name of the Teaching Faculty BIBHU RANJAN SAMAL (Sr.Lecturer)
Subject:- Geotechnical Engg.(Th.2)	No of Days/per Week Class Allotted :-04	Semester From:- 01/07/2024 To:- 08/11/2024 No of Weeks:- 15
Week	**Class Day**	**Theory/ Practical Topics**
1st	1st	1.0 INTRODUCTION 1.1- Soil and Soil Engineering. 1.2- Scope of Soil Mechanics
	2nd	2.0 PRELIMINARY DEFINITIONS AND RELATIONSHIP. 2.1- Soil as a three Phase system.
	3rd	Weight volume relationships: Water Content ,Density
	4th	Specific gravity,Voids ratio, Porosity,
2nd	1st	degree of saturation ,Percentage of air voids, air content,
	2nd	density Index, Bulk/Saturated/dry/submerged density.
	3rd	3.0 DETERMINATION OF INDEX PROPERTIES. 3.1- Water Content (Pycnometer method, Oven drying method)
	4th	3.2- Specific Gravity
3rd	1st	3.3-Particle size distribution, Sieve analysis, Wet mechanical analysis-Pipette method, Basic concept of Hydrometer Analysis
	2nd	3.4 –Consistency of Soils, Atterberg's Limits, Plasticity Index, Consistency Index, Liquidity Index
	3rd	4.0 CLASSIFICATION OF SOIL. 4.1- General.
	4th	4.2- Particle size Distribution.
4th	1st	-Textural Classification.
	2nd	-HRB Classification.
	3rd	-Unified Soil Classifications
	4th	I.S. Classification.
5th	1st	5.0 PERMEABILITY AND SEEPAGE 5.1- Concept of Permeability, Darcy's Law
	2nd	Co-efficient of Permeability,
	3rd	5.2 Factors affecting Permeability
	4th	5.3- Constant head permeability and
6th	1st	falling head permeability Test
	2nd	5.4- Seepage pressure, the phenomenon of quick sand
	3rd	5.5- Concept of flow-net, Properties and application of flow-net.
	4th	6.0 COMPACTION AND CONSOLIDATION. 6.1- Compaction, Light and heavy compaction Test
7th	1st	Optimum Moisture Content of Soil, Maximum dry density, Zero air void line
	2nd	Factors affecting Compaction
	3rd	Field compaction methods and their suitability
	4th	Consolidation, distinction between compaction and consolidation

8th	1st	Spring Analogy method, Pressure-void ratio curve, normally consolidated
	2nd	under consolidated and over consolidated soil, Assumption of Terzaghi's theory of one-dimensional consolidation, Laboratory Consolidation Test
	3rd	Co-efficient of Consolidation, Time Factor, Estimation of consolidation settlement, Difference between primary and secondary consolidation
	4th	7.0 SHEAR STRENGTH. 7.1- Concept of shear strength
9th	1st	Mohr- Coulomb failure theory,
	2nd	Cohesion, Angle of internal friction
	3rd	strength envelope for different type of soil,
	4th	Measurement of shear strength;- Direct shear test,
10th	1st	triaxial shear test, unconfined compression test and vane-shear test
	2nd	8.0 EARTH PRESSURE ON RETAINING STRUCTURES
	3rd	8.1Active earth pressure
	4th	Passive earth pressure,
11th	1st	Earth pressure at rest.
	2nd	8.2- Use of Rankine's formula for the following cases (cohesion-less soil only)
	3rd	(i) Backfill with no surcharge,
	4th	(ii) backfill with uniform surcharge.
12th	1st	iii) submerged backfill
	2nd	9.0 FOUNDATION ENGINEERING. 9.1- Functions of foundations,
	3rd	shallow and deep foundation
	4th	different type of shallow and deep foundations with sketches.
13th	1st	Types of failure (General shear, Local shear & punching shear)
	2nd	9.2 Bearing capacity of soil, bearing capacity of soils using Terzaghi's formulae & IS Code formulae for strip, Circular and square footings
	3rd	9.3 Machine Foundation: Introduction to Soil dynamics, Terms associated with soil dynamics
	4th	Free vibration and Forced vibration, Natural frequency
14th	1st	General requirements, Design of machine
	2nd	foundations: Reciprocating type , Centrifugal type, Impact type,
	3rd	REVISION
	4th	PREVIOUS YEAR QUESTION DISCUSSION
15th	1st	Isolation of foundations.
	2nd	Type of machines and machine foundation
	3rd	REVISION
	4th	PREVIOUS YEAR QUESTION DISCUSSION

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