LESSON PLAN OF 3RD SEMESTER(2023-24) CIVIL ENGINEERING

Discipline :- CIVIL	Semester:-3RD	Name of the Teaching Faculty BIBHU RANJAN SAMAL	
Subject:- Geotechnical Engg. (Th·2)	No of Days/per Week Class Allotted :-04	Semester From:- 01/08/2023 To:- 30/11/2023 No of Weeks:- 18	

Week	Class Day	Theory/ Practical Topics
1st	1st	1.0 INTRODUCTION 1.1- Soil and Soil Engineering.
	2nd	1.2- Scope of Soil Mechanics
	3rd	1.3-Origin and formation of soil
	4th	2.0 PRELIMINARY DEFINITIONS AND RELATIONSHIP. 2.1- Soil as a three Phase system.
2nd	1st	Weight volume relationships: Water Content ,Density
	2nd	Specific gravity,Voids ratio, Porosity,
	3rd	Percentage of air voids, air content, degree of saturation
	4th	Density Index, Bulk/Saturated/dry/submerged density.
3rd	1st	Relationship between -1-e & n,2-e,G,W & S_r
	2nd	3-e,S_r & n_a 4-n_a,a_c & n,5-Yd,G & e
	3rd	6-Ysat,G & e 7-Ysat,G & n 8-Y,G,e &Sr
	4th	9-Y',G & e 10-Yd,Y & w,11-Ysat,Y,Yd & Sr
4th	1st	12-Yd,G,W & Sr 13-Yd,G,W & n_a
	2nd	3.0 DETERMINATION OF INDEX PROPERTIES. 3.1- Water Content (Pycnometer method)
	3rd	Water Content (Oven drying method)
	4th	3.2- Determination of Specific Gravity by 1-Density Bottle Method
5th	1st	2- Pycnometer method
	2nd	3.3- Particle size distribution, Sieve analysis
	3rd	Wet mechanical analysis- Pipette method
	4th	Basic concept of Hydrometer Analysis, Problem
6th	1st	3.4 – Consistency of Soils, Atterberg's Limits, Plasticity Index, Consistency Index, Liquidity Index
	2nd	Problem
	3rd	4.0CLASSIFICATION OF SOIL. 4.1- General.
	4th	4.2- Particle size Distribution.
7th	1st	-Textural Classification.
	2nd	-HRB Classification.
	3rd	-Unified Soil Classifications
	4th	I.S. Classification.
8th	1st	5.0PERMEABILITY 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
9th	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
10th	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
11th	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
12th	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,
13th	1st	triaxial shear test, unconfined compression test and vane-shear test
	2nd	8.0 EARTH PRESSURE ON RETAINING STRUCTURES
	3rd	8.1 Active earth pressure
	4th	Passive earth pressure,
14th	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.
15th	1st	iii) submergedbackfill
	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.
16th	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
17th	1st	General requirements, Design of machine
	2nd	foundations: Reciprocating type , Centrifugal type, Impact type,
	3rd	REVISION
	4th	PREVIOUS YEAR QUESTION DISCUSSION
18th	1st	Isolation of foundations.
	2nd	Type of machines and machine foundation
	3rd	REVISION
	4th	PREVIOUS YEAR QUESTION DISCUSSION