LESSON PLAN OF 3RD SEMESTER(2022-23) CIVIL ENGINEERING

Discipline :- CIVIL	Semester:-3RD	Name of the Teaching Faculty BIBHU RANJAN SAMAL
Subject:- Geotechnical Engg.	No of Days/per Week Class Allotted :-04	Semester From:- **15/09/2022** To:- **22/12/2022** 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	3.0DETERMINATION 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	4.0CLASSIFICATION 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	5.0PERMEABILITY 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
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	7.0SHEAR 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	8.0EARTH 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) 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.
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