VIKASH INSTITUTE OF TECHNOLOGY, BARGARH

LESSON PLAN

Semester: 4th	**Year: 2nd**	**Course: B.Tech**
	Sub: Geotechnical Engineering	**Total Credit:03**
Branch : Civil Engg.	**Sub Code : PC 13**	
Name of the Faculty:	**Pratibha Pradhan**	
Designation :	**Asst. Professor**	
Department :	**Civil Engg.**	
Session	**2024 - 25**	
Recommended Books	**Text book**:	
	1. Principles of Geotechnical Engineering by Braja M. Das, Cengage Learning	
	2Soil Mechanics and Foundation Engineering, by K.R. Arora	
	Reference Books:	
	1 Soil Mechanics and Foundation Engineering by B.N.D. NarasingaRao	
	2Basic and applied soil mechanics, by Gopal Ranjan, A S R Rao	

Sl. No.	Lecture No.	Topics to be covered	No. of Classes
		MODULE-1	
1	Lecture-01	Origin of Soil: Rock Cycle and the origin of soil, clay mineralogy	**8**
2	Lecture-02	Mechanical analysis of soil, grain size distribution curve, particle shape and size	
3	Lecture-03	Weight volume relationships	
4	Lecture-04	Specific gravity, unit weight, void ratio, moisture content, and relationships	
5	Lecture-05	Relative density,Consistency of soil: Atterberg limits - Liquidity index and consistency index	
6	Lecture-06	Activity, soil structure	
7	Lecture-07	Engineering classification of soil	
8	Lecture-08	Types of Soil classification, IS, USCS, HRB and ASTM	
		MODULE-2	
9	Lecture-09	Soil Hydraulics: Modes of occurrence of water in soil.	10
10	Lecture-10	Stress conditions in soil- total, effective and neutral stresses and relationships.	
11	Lecture-11	Permeability - Bernaulli's equation.	
12	Lecture-12	Darcy's Law, hydraulic conductivity.	
13	Lecture-13	laboratory determination of hydraulic conductivity.	
14	Lecture-14	Factors affecting hydraulic conductivity.	
15	Lecture-15	equivalent hydraulic conductivity in stratified soil.	
16	Lecture-16	Seepage- Laplace equation of continuity, flow nets.	
17	Lecture-17	seepage calculation from a flow net, flownets in anisotropic soils.	
18	Lecture-18	seepage through earth dam, critical hydraulic gradient and quicksand condition.	
		MODULE-3	
19	Lecture-19	Soil Compaction: mechanism and principles	5
20	Lecture-20	Laboratory compaction	
21	Lecture-21	factors affecting compaction	
22	Lecture-22	effect of compaction on soil properties	
23	Lecture-23	field compaction techniques.	

		MODULE-4	
24	Lecture-24	Stress Distribution: Normal and shear stresses on a plane	
25	Lecture-25	Boussinesq's solution for a point load	
26	Lecture-26	line load, strip load, uniformly loaded circular and rectangular areas	
28	Lecture-28	Isobar and pressure bulb concept	11
29	Lecture-29	stress distribution on horizontal and vertical planes	
30	Lecture-30	Newmark's chart and its application, contact pressure	
31	Lecture-31	Shear Strength: Mohr-Coulomb failure criterion	
32	Lecture-32	shear strength parameters and determination	
33	Lecture-33	direct and tri-axial shear test, unconfined compression test, vane shear test	
34	Lecture-34	Other methods of determining the un-drained shear strength of soil	
		MODULE -V	
35	Lecture-35	Consolidation of soils: Consolidation and compaction	5
35	Lecture-36	primary and secondary consolidation	
35	Lecture-37	Terzhaghi's theory of one dimensional consolidation	
35	Lecture-38	consolidation test	
35	Lecture-39	coefficient of consolidation	

Signature of Faculty Member **Signature of HOD**

PRINCIPAL