Lesson Plan

Name of the Faculty: Deepanshu Sharma

Discipline: CIVIL ENGINEERING

Semester:5th

Subject: GEOTECHNOLOGY-I (CE-307N)

Work Load (Lecture/Practical) per week (in hours): Lectures- , Practicals-

Week	Theory		Practical	
	Lecture day	Topic (including assignment/test)	Practical day	Topic
1st	1st	UNIT-I Sub-Surface Exploration: Purpose, ,	1st	1. Grain Size Analysis-Hydrometer method
	2nd	stages in soil exploration		
	3rd	depth and lateral extent of exploration,		
	4th	guidelines for various types of structures		
2nd	5th	ground water observations, excavation and boring methods	2nd	2. Shrinkage Limit Determination.
	6th	soil sampling and disturbance, major types of samplers		
	7th	sounding methods-SCPT, DCPT, SPT & interpretation, geo-physical methods, pressure-meter test		
	8th	exploration logs.		
3rd	9th	Drainage & Dewatering:	3rd	3. Relative Density of Granular Soils.
	10th	Introduction, ditches and sumps, well point systems		
	11th	shallow well system, deep well drainage,		
	12th	vacuum method, Electro-osmosis		
4th	13th	consolidation by sand piles	4th	4. Consolidated Drained (CD) Triaxial Test
	14th	Eductor method.		
	15th	UNIT-II Shallow Foundations-I: Design criteria for structural safety of foundation		
	16th	(i) location of footing, (ii) shear failure criterion,		
5th	17th	settlement criterion, ultimate bearing capacity, modes of shear failure	5th	4. Consolidated Drained (CD) Triaxial Test
	18th	Rankine's analysis Tergazi's theory		
	19th	Rankine's analysis Tergazi's theory		
	20th	Skempton's formula, effect of fluctuation of G.W.T.		
6th	21st	effect of eccentricity on bearing	6th	5. Consolidated Undrained (CU)

		capacity, I.S Code recommendations		Triaxial Test with Pore Water Pressure measurement.
	22nd	, factors affecting bearing capacity, methods of improving bearing capacity.		
	23rd	Shallow Foundations-II: Various causes of settlement of foundation		
	24th	allowable bearing pressure based on settlement		
7th	**25th**	settlement calculation, elastic and consolidation settlement,	**7th**	5. Consolidated Undrained (CU) Triaxial Test with Pore Water Pressure measurement.
	26th	allowable settlement according to I.S.Code.		
	27th	Plate load test and its interpretation, bearing capacity from penetration tests, design bearing capacity.		
	28th	Shallow Foundations-III: Situation suitable for the shallow foundations		
8th	**29th**	types of shallow foundations and their relative merits	**8th**	6. Consolidation Test
	30th	depth of foundation, footing on slopes, uplift of footings		
	31st	conventional procedure of proportioning of footings, combined footings		
	32nd	raft foundations, bearing capacity of raft in sands and clays		
9th	**33rd**	various methods of designing rafts, floating foundations.	**9th**	6. Consolidation Test
	34th	UNIT-III Pile Foundations-I: Introduction, necessity of pile foundations,		
	35th	classification of piles, load capacity, static analysis, analysis of pile capacity in sands and clays		
	36th	dynamic analysis, pile load tests, negative skin friction, batter piles		
10th	**37th**	lateral load capacity, uplift capacity of single pile, under-reamed pile.	**10th**	7. Undisturbed Sampling.
	38th	Pile Foundations-II: Group action in piles, pile spacing		
	39th	, pile group capacity, stress on lower strata		
	40th	settlement analysis, design of pile caps		
11th	**41st**	, negative skin friction of pile group, uplift resistance of pile group	**11th**	8. Standard Penetration Test
	42nd	lateral resistance, batter pile group.		

	43rd	UNIT-IV Drilled Piers and Caisson Foundations:		
	44th	Drilled piers-types, uses, bearing capacity, settlement		
12th	**45th**	Drilled piers-types, uses, bearing capacity, settlement	**12th**	8. Standard Penetration Test
	46th	construction procedure		
	47th	Caissons-Types, bearing capacity and settlement		
	48th	Caissons-Types, bearing capacity and settlement		
13th	**49th**	construction procedure. well foundations-shapes	**13th**	9. Dynamic Cone Penetration Test.
	50th	construction procedure. well foundations-shapes		
	51st	depth of well foundations		
	52nd	components, factors affecting well foundation design lateral stability		
14th	**53rd**	components, factors affecting well foundation design lateral stability	**14th**	9. Dynamic Cone Penetration Test.
	54th	construction procedure, sinking of wells		
	55th	construction procedure, sinking of wells		
	56th	sinking of wells		
15th	**57th**	rectification of tilts and shifts	**15th**	10. Model Plate Load Test.
	58th	rectification of tilts and shifts		
	59th	recommended values of tilts & shifts as per I.S.3955.		
	60th	recommended values of tilts & shifts as per I.S.3955.		