Subject: PE/CE/55-T **Geotechnology** **Sem:5th**

Theory			
Week	**Lecture-Day**	**Topic (Including Assignment/Test)**	**Date**
1	1	Sub-Surface Exploration: Purpose, stages in soil exploration, depth and lateral extent of exploration,	
	2	guidelines for various types of structures, ground water observations, excavation and boring methods, soil sampling and disturbance,	
	3	major types of samplers, sounding methods-SCPT, DCPT, SPT and interpretation,	
2	4	geophysical methods, pressure-meter test, exploration logs.	
	5	Drainage & Dewatering: Introduction, ditches and sumps, well point systems, shallow well system,	
	6	deep well drainage, vacuum method, Electro-osmosis, consolidation by sand piles	
3	7	Shallow Foundations-I: Design criteria for structural safety of foundation (i) location of footing, (ii) shear failure criterion, (iii) settlement criterion.	
	8	Ultimate bearing capacity, modes of shear failure, Rankine's analysis.	
	9	Tergazi's theory. Skempton's formula. Effect of fluctuation of G.W.T. Effect of eccentricity on bearing capacity, inclined load, I.S Code recommendations.	
4	10	Factors affecting bearing capacity, methods of improving bearing capacity.	
	11	Shallow Foundations-II: Various causes of settlement of foundation, allowable bearing pressure based on settlement, settlement calculation,	
	12	elastic and consolidation settlement, allowable settlement according to I.S.Code.	
5	13	Plate load test and its interpretation, bearing capacity from penetration tests, design bearing capacity.	
	14	Shallow Foundations-III: Situation suitable for the shallow foundations, types of shallow foundations and their relative merits,.	
	15	depth of foundation, footing on slopes, uplift of footings, conventional procedure of proportioning of footings,	
6	16	combined footings, raft foundations, bearing capacity of raft in sands and clays,	
	17	various methods of designing rafts, floating foundations	
	18	Pile Foundations-I: Introduction, necessity of pile foundations,	
7		**Minor Test 1**	
8	19	classification of piles, load capacity, static analysis,	
	20	analysis of pile capacity in sands and clays, dynamic analysis,	
	21	analysis of pile capacity in sands and clays, dynamic analysis,	
9	22	pile load tests	
	23	negative skin friction,	
	24	batter piles, lateral load capacity, uplift capacity of single pile,	
10	25	under-reamed pile.	
	26	Pile Foundations-II: Group action in piles, pile spacing, pile group capacity	
	27	stress on lower strata,	
11	28	settlement analysis,	
	29	design of pile caps,	
	30	negative skin friction of pile group	
12	31	uplift resistance of pile group, lateral resistance, batter pile group.	
	32	Drilled Piers and Caisson Foundations: Drilled piers-types, uses, bearing capacity	
	33	Drilled Piers and Caisson Foundations: settlement, construction procedure	
13	34	Caissons-Types, bearing capacity and settlement, construction procedure.	
	35	Caissons-Types, bearing capacity and settlement, construction procedure.	
	36	Well foundations-shapes, depth of well foundations, components, factors affecting,	
14		**Minor Test 2**	
15	37	well foundation design lateral stability,	
	38	construction procedure, sinking of wells, rectification of tilts and shifts,	
	39	recommended values of tilts & shifts as per I.S.3955.	