Semester: 4th Subject: Soil Mechanics (PC/CE/43-T)			
Week	**Lecture Day**	**Topics**	**Remarks**
1st	1	**Soil Formation and Composition:** Introduction, soil and rock, Soil Mechanics and Foundation Engineering, origin of soils, weathering, soil formation,	
	2	Major soil deposits of India, particle size, particle shape, inter particle forces,	
	3	soil structure, principal clay minerals.	
	4	**Basic Soil Properties:** Introduction, three phase system, weight-volume relationships	
2nd	5	soil grain properties, soil aggregate properties, grain size analysis	
	6	sieve analysis, sedimentation analysis, grain size distribution curves	
	7	consistency of soils, consistency limits and their determination,	
	8	activity of clays, relative density of sands.	
3rd	9	**Classification of soils:** Purpose of classification, classification on the basis of grain size, classification on the basis of plasticity,	
	10	plasticity chart, Indian Standard Classification System	
	11	**Permeability of Soils:** Introduction, Darcy's law and its validity,	
	12	discharge velocity and seepage velocity, factors affecting permeability	
4th	13	, laboratory determination of coefficient of permeability,	
	14	determination of field permeability, permeability of stratified deposits	
	15	**Effective Stress Concept:** Principle of effective stress, effective stress under hydrostatic conditions,	
	16	capillary rise in soils, effective stress in the zone of capillary rise,	
5th	17	effective stress under steady state hydro-dynamic conditions	
	18	seepage force, quick condition,	
	19	critical hydraulic gradient, two-dimensional flow,	
	20	Laplace's equation	
6th	21	Properties and utilities of flow net,	
	22	graphical method of construction of flow nets, piping, protective filter	
	23	**Compaction:** Introduction, role of moisture and compactive effect in compaction	
	24	laboratory determination of optimum moisture content, moisture density relationship,	
7th	25	**MINOR TEST I**	
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8th	29	compaction in field, compaction of cohesion less soils, moderately cohesive soils and clays	
	30	Field control of compaction.	
	31	**Compressibility and Consolidation:** Introduction, components of total settlement,	
	32	consolidation process, one-dimensional consolidation test	
9th	33	Typical void ratio-pressure relationships for sands and clays	
	34	Normally consolidated and over consolidated clays,	
	35	Casagrande's graphical method of estimating pre-consolidation pressure,	
	36	Terzaghi's theory of one-dimensional primary consolidation	
10th	37	Determination of coefficients of consolidation, consolidation settlement,	
	38	Construction period settlement, secondary consolidation	
	39	**Shear Strength:** Introduction, Mohr stress circle	
	40	Mohr stress circle: stresses	
11th	41	Mohr-Coulomb failure-criterion, relationship between principal stresses at failure	
	42	shear tests, direct shear test,	
	43	Unconfined compression test	
	44	Triaxial compression tests	
12th	45	Drainage conditions and strength parameters	
	46	Vane shear test	
	47	Shear strength characteristics of sands	
	48	shear strength characteristics of normally consolidated clays	
13th	49	shear strength characteristics of normally over-consolidated clays and partially saturated soils	
	50	Sensitivity and Thixotropy.	
	51	**Earth Pressure:** Introduction, earth pressure at rest,	
	52	Rankine's active & passive states of plastic equilibrium	
14th	53	**MINOR TEST II**	
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15th	57	Rankine's earth pressure theory	
	58	Coulomb's earth pressure theory,	
	59	Culmann's graphical construction,.	
	60	Rebhann's construction	