

Lesson Plan/ Course Break – up
PCC-CVE306-T SOIL MECHANICS

Discipline : B.Tech in Civil Engineering
Semester : 6th (3rd Year)
Subject : PCC-CVE306-T, SOIL MECHANICS
Work Load (Lecture / Practical) per week (in hrs.) : Lectures – 03

Week	Theory	
	Lecture day	Topic (Including Assignment Test)
1 st	1	• Introduction, soil and rock, Soil Mechanics and Foundation Engineering
	2	• Origin of soils, weathering, soil formation, major soil deposits of India
	3	• Particle size, particle shape, inter particle forces, soil structure, principal clay minerals
2 nd	4	• Basic Soil Properties: Introduction, three phase system, weight-volume relationships, soil grain properties,
	5	• Soil aggregate properties, grain size analysis, sieve analysis, sedimentation analysis,
	6	• Grain size distribution curves, consistency of soils, consistency limits and their determination, activity of clays, relative density of sands
3 rd	7	• Classification of soils, Purpose of classification, classification on the basis of grain size
	8	• Classification on the basis of plasticity, plasticity chart, Indian Standard classification System.
	9	• Permeability of Soils, Introduction, Darcy's law and its validity, Discharge velocity and seepage velocity,
4 th	10	• Factors affecting permeability, Laboratory determination of coefficient of permeability,
	11	• Determination of field permeability, permeability of stratified deposits, Effective Stress Concept,
	12	• Principle of effective stress, effective stress under hydrostatic conditions, Capillary rise in soils, effective stress in the zone of capillary rise
5 th	13	• Effective stress under steady state hydro-dynamic conditions, seepage force,
	14	• Quick condition, critical hydraulic gradient, Two dimensional flow, Laplace's equation,
	15	• Properties and utilities of flow net, graphical method of construction of flow nets, Piping, protective filter
6 th	16	• Compaction: Introduction, role of moisture and compactive effect in compaction
	17	• Laboratory determination of optimum moisture content, moisture density relationship,
	18	• Compaction in field, compaction of cohesionless soils, Moderately cohesive soils and clays, field control of compaction

7 th	19	MINOR TEST I
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8 th	22	Compressibility and Consolidation: Introduction, components of total settlement, consolidation process
	23	- One-dimensional consolidation test, typical void ratio-pressure relationships for sands and clays,
	24	normally consolidated and over consolidated clays
9 th	25	Casagrande's graphical method of estimating pre-consolidation pressure,
	26	Terzaghi's theory of one-dimensional primary consolidation,
	27	Numerical Problems
10 th	28	Determination of coefficients of consolidation, consolidation settlement,
	29	Construction period settlement, secondary consolidation.
	30	Shear Strength: Introduction, Mohr stress circle, Mohr-Coulomb failure-criterion,
11 th	31	Relationship between principal stresses at failure,
	32	shear tests, direct shear test
	33	Unconfined compression test, Triaxial compression tests
12 th	34	Drainage conditions and strength parameters
	35	Vane shear test, shear strength characteristics of sands
	36	Normally consolidated clays, over-consolidated clays and partially saturated soils, Sensitivity and thixotropy
13 th	37	Earth Pressure: Introduction, earth pressure at rest,
	38	Rankine's active & passive states of plastic equilibrium,
	39	Rankine's earth pressure theory
14 th	40	MINOR TEST II
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15 th	43	Coulomb's earth pressure theory,
	44	Culmann's graphical construction
	45	Rebhann's construction

