

TEACHING PLAN FOR THEORY

Subject Teacher: Darshana V Ainchwar

Subject: Geotechnical Engineering I		Class: S. Y. B.Tech SEM-I	Branch: Civil	Year 2017-2018
Lecture No	Scheduled Date	Topics to be covered on the scheduled date		
1		Syllabus Discussion, Discussion on course objective & course outcome		
Unit – I				
2		Soil Formation : Formation of soil, residual & transported soils,		
3		generally used in practice such as sand, gravel, organic silt, clay, Bentonite, black cotton soil etc.,		
4		major soil deposit of India,		
5		field identification of soil, soil mineralogy		
6		Phases of Soil : Various soil weight & volume inter relationship,		
7		three phase relations,		
8		Problems on three phase relations,		
9		Physical Properties of soil.		
Unit – II				
10		Physical Properties : Specific gravity, water content,		
11		Physical Properties : shape and size, grain size distribution curves,		
12		Physical Properties : soil classification system-IS System		

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13		Physical Properties : soil classification system Unified System		
14		Physical Properties : relative density,		
15		Physical Properties : in situ density,		
16		Physical Properties : consistency of soils I		
17		Physical Properties : consistency of soils II		
Unit – III				
18		Permeability: Soil water, permeability definition and necessity of its study, Darcy's law, factors affecting permeability.		
19		Laboratory measurement of permeability – Constant head method as per IS 2720.		
20		Laboratory measurement of permeability – Falling head method as per IS 2720		
21		Permeability of stratified soil deposits.		
22		Seepage: Seepage and Seepage Pressure, quick sand phenomenon,		
23		critical hydraulic gradient, General flow equation for 2-D flow (Laplace equation),		
24		Flow Net, properties and application,		
25		Flow Net construction for flow under sheet pile		
26		Flow Net construction for flow under earthen dam.		

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Module IV

Lecture No	Scheduled Date	Topics to be covered on the scheduled date
27		Compaction- Introduction, compaction tests- Standard Proctor test, Modified Proctor test, Zero air void line.
28		Factors affecting compaction. Effect of compaction on soil properties.
29		Field compaction methods and compaction equipment's for different types of soil
30		Placement water content, Proctor needle in field compaction control.
31		Stress Distribution in Soils: Geostatic stress, Boussinesq's theory with assumptions for point load and circular load (with numerical),
32		Pressure Distribution diagram on a horizontal and vertical plane,
33		Pressure bulb and its significance.
34		Westergaard's theory, equivalent point load method, Approximate stress distribution method
Unit – V		
35		Shear Strength: Introduction- Shear strength an Engineering Property.
36		Mohr's stress circle, Mohr-Coulomb failure theory.
37		Measurement of Shear Strength- Direct Shear test Their suitability for different types of soils, advantages and disadvantages.
38		Measurement of Shear Strength- Triaxial Compression test Their suitability for different types of soils, advantages and disadvantages.
39		Measurement of Shear Strength- Unconfined Compression test Their suitability for different types of soils, advantages and disadvantages.

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40		Measurement of Shear Strength- Vane Shear test Their suitability for different types of soils, advantages and disadvantages.		
41		Different drainage conditions for shear tests.		
42		Problems on shear strength		
43		Sensitivity and thixotropy of cohesive soils.		
Unit – VI				
44		Earth Pressure- Introduction, Rankine's state of Plastic Equilibrium in soils- Active and Passive states due to wall movement, Earth Pressure at rest.		
45		Rankine's state of Plastic Equilibrium in soils- Passive states due to wall movement, Earth Pressure at rest.		
46		Rankine's Theory- Earth pressure on Retaining wall due to submerged backfill, Backfill with uniform surcharge, backfill with sloping surface, layered backfill.		
47		Problems on Earth Pressure		
48		Coulomb's Wedge theory.		
49		Rebhann's and Culmann's graphical method of determination of earth pressure.		
50		Stability of Slopes- Classification of slopes and their modes of failure,		
51		Taylor's stability number, Infinite Slopes in cohesive and cohesion less soil,		
52		Landslides- Causes and remedial measures.		

