

Subject code :- 2020574(020)

Geotech Engineering
5th sem
CIVIL Engineering

Pankaj Guchha

Detailed Teaching Plan

Lecture No.	Unit No	Topics to be covered	Planned Date	Execution Date	Remark
1	1	1.1 Weight and Volume Relationships	18/9/24	18/9/24	
2		1.1.1 Definition of soil and soil mechanics or Geotechnical Engineering, field application of Geotechnical Engineering	18/9/24	18/9/24	
3		1.1.2 Soil as a three-phase system, types of soil water, water content, Void ratio, porosity and degree of saturation, water content, density and unit weights, specific gravity, density index and relative compaction and functional relationship among them.	19/9/24	18/9/24	
4		1.2.3 Determination of water content, specific gravity and bulk density	19/9/24	19/9/24	
5		1.2 Index Properties and Soil Classification	24/9/24	24/9/24	
6		1.2.1 Particle size analysis, mechanical sieve analysis, sedimentation analysis, Stoke's law, pipette method and hydrometer method, particle size distribution curve and its interpretation	24/9/24	24/9/24	
7		1.2.2 Consistency of soil, stages of consistency, Atterberg's limits of consistency, relationship between consistency limits, Determination of liquid limit, plastic limit and shrinkage limit.	25/9/24	26/9/24	
8		1.2.3 Particle size classification of soils & IS classification of soil.	25/9/24	26/9/24	
9		2.1 Permeability	26/9/24	26/9/24	

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10	2.1.1 Definition of permeability, Darcy's law of permeability, coefficient of permeability, Factors affecting permeability. 2.1.2 Determination of coefficient of permeability by constant head and falling head	26/9/24	3/10/24	
11	2.2 Well Hydraulics	03/10/24	03/10/24	
12	2.2.1 Aquifer, aquiclude, aquifuge, coefficient of transmissibility	03/10/24	04/10/24	
13	2.2.2 Formulae for discharge through unconfined and confined aquifer for steady radial flow by Dupuit's Theory (no derivation), field determination of coefficient of permeability and coefficient of transmissibility	05/10/24	04/10/24	
14	2.3 Seepage	05/10/24	08/10/24	
15	2.3.1 Seepage through earthen structures, head, gradient and potential, seepage velocity, seepage pressure, quicksand condition.	06/10/24	08/10/24	
16	2.3.2 Flow net, characteristics of flow net, application of flow net (no numerical problems), phreatic line.	06/10/24	08/10/24	
17	3.1 Shear failure of soil, concept of shear strength of soil, components of shearing resistance of soil – cohesion, internal friction	08/10/24	09/10/24	
18	3.1 Shear failure of soil, concept of shear strength of soil, components of shearing resistance of soil – cohesion, internal friction	08/10/24	05/10/24	

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19	3	3.2 Mohr-Coulomb failure theory, Strength envelope, strength equation 3.3 Effective stress principle-total pressure, effective pressure, neutral pressure, shear strength equation in	17/10/24	09/10/24	
20		3.3 Effective stress principle-total pressure, effective pressure, neutral pressure, shear strength equation in terms of effective pressure, Mohr's stress circle.	17/10/24	18/10/24	
21		3.4 Determination of shear strength- types of shear test depending upon drainage condition, Direct shear test, Tri-axial test Unconfined compression test, Vane shear test	22/10/24	18/10/24	
22	4	4.1 Compaction of Soil	22/10/24	23/10/24	
23		4.1.2 Concept of compaction, purpose of compaction field situations where compaction is required.	23/10/24	23/10/24	
24		4.2 Standard proctor test – test procedure as per IS code, compaction curve, optimum moisture content, maximum dry density, zero air voids	23/10/24	25/10/24	
25		4.3 Modified proctor test	24/10/24	25/10/24	
26		4.4 Factors affecting compaction	24/10/24	5/11/24	
27		4.5 Field methods of compaction – rolling, ramming & vibration and suitability of various compaction equipment's, placement water content, field compaction control.	5/11/24	5/11/24	
28		4.6 Difference between compaction and consolidation	05/11/24	6/11/24	

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29	4.7 Earth Pressure -	06/11/24	8/11/24	
30	4.7.1 Definition of active earth pressure, Neutral pressure and passive earth pressure,	06/11/24	6/11/24	
31	4.7.2 Structures subjected to earth pressure in the field.	12/11/24	14/11/24	
32	4.7.3 Rankine's theory	12/11/24	14/11/24	
33	4.7.4 Calculation of active and passive earth pressure (simple cases).	13/11/24	25/11/24	
34	5.1 Bearing Capacity of Soils	13/11/24	25/11/24	
35	5.1.1 Concept of bearing capacity, ultimate bearing capacity, safe bearing capacity and allowable bearing pressure	14/11/24	26/11/24	
36	5.1.2 Terzaghi's analysis and assumptions	14/11/24	27/11/24	
37	5.1.3 Effect of water table on bearing capacity	15/11/24	27/11/24	
38	5.1.4 IS code method for computing bearing capacity.	19/11/24	27/11/24	
39	5.1.5 Field methods for determination of bearing capacity – Plate load test and standard penetration test. Test procedures as Per IS:1888 & IS:2131	20/11/24	28/11/24	
40	5.1.6 Typical values of bearing capacity from building code IS:1904	20/11/24	28/11/24	
41	5.1.6 Liquefaction (in brief)	21/11/24	28/11/24	
42	5.2 Stabilization of soil	21/11/24	28/11/24	
43	5.2.1 Concept of stabilization, necessity of soil stabilization,	26/11/24	28/11/24	

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44	5.2.2 Different methods of soil stabilization – Mechanical soil stabilization, lime stabilization, cement stabilization, bitumen stabilization, fly-ash stabilization.	03/12/24	29/11/24	
45	5.3 Site Investigation and Sub Soil Exploration	03/12/24	29/11/24	
	5.3.1 Necessity investigation & exploration.	4/12/24	29/11/24	
46	5.3.2 Method exploration open excavation & boring	4/12/24	30/11/24	
47	5.3.3 Criteria for deciding the location and number of test pits and bores	5/12/24	30/11/24	
48	5.3.4 Methods of exploration, disturbed & undisturbed soil samples for lab testing.	5/12/24	30/11/24	

Total class Required = 48

Total class conducted = 45

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Teacher's signature

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