

Department of Civil Engineering			
Name of the Faculty		Mr. Bharat Verma	
Semester: 4th		(L 03)	
Subject: Lesson Plan Duration :		Soil Mechanics and Foundation Engineering Pr-4) T - (20/01/2025 to 02/05/2025) 15 weeks	
Week	Lecture day	Topic	Delivery Date of Lecture
1st	1st	Importance of Soil Studies in Civil Engineering, Geological origin of soils with special reference to soil profiles in India	
	2nd	Residual and transported soil, alluvial deposits, lake deposits, local soil found in Punjab, dunes and loess, glacial deposits, black cotton soils,	
	3rd	Conditions in which various deposits are formed and their engineering characteristics.	
2nd	4th	Names of organizations dealing with soil engineering work in India, soil map of India	
	5th	Constituents of soil and representation by a phase diagram, Void ratio, porosity, degree of saturation, water content, specific gravity	
	6th	Unit weight, bulk density/bulk unit weight, dry unit weight, saturated unit weight and submerged unit weight of soil grains	
3rd	7th	Particle size, shape, and their effect on engineering properties of soil	
	8th	Particle size classification of soils, Gradation and its influence on engineering properties	
	9th	Relative density and its use in describing cohesionless soils, Behaviour of cohesive soils with change in water content	
4th	10th	Atterberg's limit - definitions, use and practical significance	
	11th	Field identification tests for soils	
	12th	Revision	
	13th	Sessional Test-1	
5th	14th	Concept of permeability and its importance	
	15th	Darcy's law, coefficient of permeability, seepage velocity	
6th	16th	Factors affecting permeability, Comparison of permeability of different soils as per BIS	

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7th	17th	Measurement of permeability in the laboratory	
	18th	Stresses in subsoil, Definition and meaning of total stress, effective stress and neutral stress	
	19th	Principle of effective stress, Importance of effective stress in engineering problems	
8th	20th	Consolidation and settlement	
	21st	Creep and Plastic flow	
	22nd	Heaving, Lateral Movement, Freeze and Thaw of soil	
9th	23rd	Meaning of total settlement, uniform settlement, and differential settlement; rate of settlement and their effects	
	24th	Settlement due to construction operations and lowering of water table	
	25th	Tolerable settlement for different structures as per BIS	
10th	26th	Concept and Significance of shear strength Sessional Test - 2	
	27th	Factors contributing to shear strength of cohesive and cohesion less soils, Coulomb's law	
	28th	Definition and necessity of compaction, Laboratory compaction test (standard and modified proctor test as per IS) definition	
11th	29th	Importance of optimum water content, maximum dry density	
	30th	Moisture dry density relationship for typical soils with different compactive efforts	
	31st	Compaction control; Density control, measurement of field density by core cutter method and sand replacement method	
12th	32nd	moisture control, Proctor's needle and its use, thickness control	
		Purpose and necessity of soil exploration, Reconnaissance, methods of soil exploration Trial pits borings (auger wash rotary percussion to be	
		Sampling; undisturbed, disturbed, and representative samples; selection of type of sample; thin wall and piston samples	
13th	34th		
	35th	area ratio, recovery ratio of samples and their significance, number, and quantity of samples recutting, sealing and preservation of samples	
	36th	Presentation of soil investigation results Concept of bearing capacity, Definition and significance of ultimate bearing capacity, net safe bearing capacity and allowable bearing pressure	
	37th	Factors affecting bearing capacity, Improvement of bearing capacity by sand drain method, compaction, use of geo- synthetics.	

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14th	38th	Concept of shallow and deep foundation, types of shallow foundations: combined, isolated, strip, mat, and their suitability.	
	39th	Factors affecting the depth of shallow foundations, deep foundations, type of piles and their suitability; pile classification based on material, pile group and pile cap.	
	40th	Sessional Test – 3	

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