Lesson Plan

Name of the Faculty: Deepak Kumar Panwar

Discipline : Civil Engineering

Semester : 4th sem

Subject: Soil Mechanics and Foundation Engineering

Lesson Plan Duration : (January -May 2026) 15 weeks

(Teaching hours :Theory=3,Practical=2)

Week	Lecture day	Topic	Delivery Date of Lecture	Whether the lesson Plan followed? Yes/No
1st	1	Importance of Soil Studies in Civil Engineering, Geological origin of soils with special reference to soil profiles in India		
	2	Residual and transported soil, alluvial deposits, lake deposits, local soil found in Punjab, dunes and loess, glacial deposits, black cotton soils,		
	3	Conditions in which various deposits are formed and their engineering characteristics.		
2nd	4	Names of organizations dealing with soil engineering work in India, soil map of India		
	5	Constituents of soil and representation by a phase diagram, Void ratio, porosity, degree of saturation, water content, specific gravity		
	6	Unit weight, bulk density/bulk unit weight, dry unit weight, saturated unit weight and submerged unit weight of soil grains		
3rd	7	Particle size, shape, and their effect on engineering properties of soil		

	8	Particle size classification of soils, Gradation and its influence on engineering properties		
	9	Relative density and its use in describing cohesionless soils, Behavior of cohesive soils with change in water content		
4th	10	Atterberg's limit - definitions, use and practical significance		
	11	Field identification tests for soils		
	12	Revision		
5th	13	Sessional Test-1		
	14	Concept of permeability and its importance		
	15	Darcy's law, coefficient of permeability, seepage velocity		
6th	16	Factors affecting permeability, Comparison of permeability of different soils as per BIS		
	17	Measurement of permeability in the laboratory		
	18	Stresses in subsoil, Definition and meaning of total stress, effective stress and neutral stress		
7th	19	Principle of effective stress, Importance of effective stress in engineering problems		
	20	Consolidation and settlement		
	21	Creep and Plastic flow		
8th	22	Heaving, Lateral Movement, Freeze and Thaw of soil		
	23	Meaning of total settlement, uniform settlement, and differential settlement; rate of settlement and their effects		
	24	Settlement due to construction operations and lowering of water table		
9th	25	Tolerable settlement for different structures as per BIS		
	26	Concept and Significance of shear strength		
	27	Factors contributing to shear strength of cohesive and cohesion less soils, Coulomb's law		

10th	28	Definition and necessity of compaction, Laboratory compaction test (standard and modified proctor test as per IS) definition		
	29	Importance of optimum water content, maximum dry density		
	30	Moisture dry density relationship for typical soils with different compactive efforts		
11th	31	Compaction control; Density control, measurement of field density by core cutter method and sand replacement method		
	32	moisture control, Proctor's needle and its use, thickness control		
	33	Purpose and necessity of soil exploration, Reconnaissance, methods of soil exploration, Trial pits, borings (auger, wash, rotary, percussion to be briefly dealt)		
12th	34	Sampling; undisturbed, disturbed, and representative samples; selection of type of sample; thin wall and piston samples		
	35	area ratio, recovery ratio of samples and their significance, number, and quantity of samples, resetting, sealing and preservation of samples.		
	36	Presentation of soil investigation results		
13th	37	Sessional Test – 2		
	38	Concept of bearing capacity, Definition and significance of ultimate bearing capacity, net safe bearing capacity and allowable bearing pressure		
	39	Factors affecting bearing capacity,		
14th	40	Improvement of bearing capacity by sand drain method, compaction, use of geo- synthetics.		
	41	Concept of shallow and deep foundation, types of shallow foundations: combined, isolated, strip, mat, and their suitability.		
	42	Factors affecting the depth of shallow foundations, deep foundations,		

15th	43	type of piles and their suitability; pile classification based on material, pile group and pile cap.		
	44	Sessional Test - 3		
	45	Revision		