LESSON PLAN

Name of the Faculty : Rina
Discipline : Civil ENGINEERING
Semester : 4th
Subject Soil and Foundation Engg.
Lesson Plan Duration : 15 WEEKS(From 22/3/2021 to 2/7/2021)
Work Load (Lecture) per week (in hours) : Theory-04 ; Practical-02

WEEK	THEORY		WEEK	PRACTICAL		
	LECTURE DAY	TOPIC		PRACTICAL DAY	Expt. No.	Experiment
1st	1st	Introduction of the subject	1st	1st	1	To determine the moisture content of A given sample of soil
	2nd	Importanceof soil studies in Civil Engineering				
	3rd	Geological origin of soils with special reference to soil profiles in India		2nd	1	To determine the moisture content of A given sample of soil
	4th	residual and transported soil, alluvial deposits, lake deposits, local soil found in J&K, dunes and loess				
2nd	1st	glacial deposits, black cotton soils,condition in which above deposits are formed and their engineering characteristics	2nd	1st	2	Auger Boring and Standard Penetration Test a) Identifying the equipment and accessories b) Conducting boring and SPT at a given location
	2nd	Names of organizations dealing with soil engineering work in India, soil map of India				
	3rd	Physical Properties of Soils:Constituents of soil and representation by a phase diagram		2nd	2	Auger Boring and Standard Penetration Test a) Identifying the equipment and accessories b) Conducting boring and SPT at a given location
	4th	Definitions of void ratio, porosity, water content,				
3rd	1st	degree of saturation,specific gravity, unit weight, bulk density/bulk unit weight,	3rd	1st	2	Auger Boring and Standard Penetration Test c) Collecting soil samples and their identification d) Preparation of boring log and SPT graphs e) Interpretation of testresults
	2nd	dry unit weight, saturated unit weight and submerged unit weight of soil grains and correlation between them				
	3rd	Simple numerical problems with the help of phase diagrams		2nd	2	Auger Boring and Standard Penetration Test c) Collecting soil samples and their identification d) Preparation of boring log and SPT graphs e) Interpretation of testresults
	4th	Classification and Identification of Soils Particle size, shape on engineering properties soil,particle size classification of soils				
4th	1st	Gradation and its influence on engineering properties	4th	1st	3	Extraction of Disturbed and Undistrubed Samples a) Extracting a blocksample b) Extracting a tube sample
	2nd	Relative density and its use in describing cohesionless soils				
	3rd	Behaviour of cohesive soils with change in water content, Atterberg's limit definitions, use and practical significance		2nd	3	Extraction of Disturbed and Undistrubed Samples a) Extracting a blocksample b) Extracting a tube sample

	4th	Field identification tests for soils				
5th	1st	Soil classification system as per BIS 1498; basis, symbols,major division sand sub divisions, groups, plasticity chart; procedure for classification of a given soil	5th	1st	3	Extraction of Disturbed and Undistrubed Samples c) Extracting a disturbed samples for me Chemical analysis. d) Field identification of samples
	2nd	Flow of Water Through Soils: Concept of permeability and its importance				
	3rd	Darcy's law, coefficient of permeability, seepage velocity and factors affecting permeability		2nd	3	Extraction of Disturbed and Undistrubed Samples c) Extracting a disturbed samples for me Chemical analysis. d) Field identification of samples
	4th	Comparison of permeability of different soils as per BIS				
6th	1st	Measurement of permeability in the laboratory	6th	1st	4	Field Density Measurement (Sand Replacement and Core Cutter Method) a) Calibration of sand b) Conducting field density test at a given location
	2nd	Effective Stress: (Concept only): Stresses in subsoil				
	3rd	Definition and meaning of total stress, effective stress and neutral stress		2nd	4	Field Density Measurement (Sand Replacement and Core Cutter Method) a) Calibration of sand b) Conducting field density test at a given location
	4th	Principle of effective stress				
7th	1st	Importance of effective stress in engineering problems	7th	1st	4	Field Density Measurement (Sand Replacement and Core Cutter Method) c) Determination of water content d) Computation and interpretation of results
	2nd	Deformation of Soils : Meaning, conditions/situations of occurrence with emphasis on practical significance of: a) Consolidation and settlement				
	3rd	b) Creep c) Plastic flow		2nd	4	Field Density Measurement (Sand Replacement and Core Cutter Method) c) Determination of water content d) Computation and interpretation of results
	4th	d)Heaving e)Lateral movement f)Freeze and thaw of soil				

8th	1st	Definition and practical significance of compression index, coefficient of consolidation, degree of consolidation	8th	1st	5	Liquid Limit and Plastic Limit Determination: a) Identifying various grooving tools b) Preparation of sample
	2nd	Meaning of total settlement, uniform settlement and differential settlement; rate of settlement and their effects				
	3rd	Settlement due to construction operations and lowering of water table		2nd	5	Liquid Limit and Plastic Limit Determination: a) Identifying various grooving tools b) Preparation of sample
	4th	**Tolerable settlement for different structures as per BIS**				
9th	1st	Shear Strength Characteristics of Soil: Concept and Significance of shear strength	9th	1st	5	Liquid Limit and Plastic Limit Determination: c) Conducting the test d) Observing soil behaviour during tests e) Computation, plotting and interpretation of results
	2nd	Factors contributing to shear strength of cohesive and cohesion less soils,Coulomb's law				
	3rd	Examples of shear failure in soils		2nd	5	Liquid Limit and Plastic Limit Determination: c) Conducting the test d) Observing soil behaviour during tests e) Computation, plotting and interpretation of results
	4th	Compaction: Definition and necessity of compaction				
10th	1st	Laboratory compaction test (standard and modified proctor test as per BIS definition and importance of optimum water content	10th	1st	6	Mechanical Analysis a) Preparation of sample b) Conducting sieve analysis c) Computation of results
	2nd	maximum dry density; moisture dry density relationship for typical soils with different compactive efforts				
	3rd	Metals:Ferrous metals: Composition, properties and uses of cast iron, mild steel, HYSD steel, high tension steel as per BIS.		2nd	6	Mechanical Analysis a) Preparation of sample b) Conducting sieve analysis c) Computation of results
	4th	Compaction control; Density control, measurement of field density by core cutter method and sand replacement method, moisture				
11th	1st	Proctor's needle and its use, thickness control, jobs of an embankment supervisor in relation to compaction	11th	1st	6	Mechanical Analysis d) Plotting the grain size distribution curve e) Interpretation of the curve
	2nd	Soil Exploration: Purpose and necessity of soil exploration				
	3rd	Reconnaissance, methods of soil exploration, Trial pits,borings (auger,wash, rotary, percussion to be briefly dealt		2nd	6	Mechanical Analysis d) Plotting the grain size distribution curve e) Interpretation of the curve
	4th	Sampling; undisturbed,disturbed and representative samples; selection of type of sample; thin wall and piston samples; area ratio,				
12th	1st	samples and their significance, number and quantity of samples, resetting, sealing and preservation of samples.Presentation of soil investigation results	12th	1st	7	Laboratory Compaction Tests (Standard Proctor Test) a) Preparation of sample b) Conducting the test c) Observing soil behaviour during test d) Computation of results and plotting e) Determination of optimum moisture content and maximum dry density
	2nd	Definition and significance of ultimate bearing capacity, net safe bearing capacity and allowable bearing pressure				
	3rd	Guidelines of BIS (IS6403) for estimation of bearing capacity of soil		2nd	7	Laboratory Compaction Tests (Standard Proctor Test) a) Preparation of sample b) Conducting the test c) Observing soil behaviour during test d) Computation of results and plotting e) Determination of optimum moisture content and maximum dry density
	4th	Concept of vertical stress distribution in soils due to foundation loads, pressure bulb				

13th	1st	Applications of SPT, unconfined compression test and direct shear test in estimation of bearing capacity	13th	1st	8	Demonstration of Unconfined Compression Test a) Specimen preparation b) Conducting the test c) Plotting the graph d) Interpretation of results and finding/bearing capacity
	2nd	Plate load test (no procedure details) and its limitations				
	3rd	Factors affecting bearing capacity		2nd	8	Demonstration of Unconfined Compression Test a) Specimen preparation b) Conducting the test c) Plotting the graph d) Interpretation of results and finding/bearing capacity
	4th	Bearing Capacity of soil Concept of bearing capacity				
14th	1st	Improvement of bearing capacity by sand drain method	14th	1st	9	Demonstration of: a) Direct Shear and Vane Shear Test on sandy soil samples b) Permeability test apparatus
	2nd	compaction, use of geo synthetics, use of geo synthetics				
	3rd	Foundation Engineering: Concept of shallow and deep foundation;		2nd	9	Demonstration of: a) Direct Shear and Vane Shear Test on sandy soil samples b) Permeability test apparatus
	4th	types of shallow foundations: isolated combined, strip mat, and their suitability. Factors affecting the depth of shallow foundations				
15th	1st	deep foundations, type of piles and their suitability	15th	1st		Internal Viva
	2nd	pile classification on the basis of material, pile group and pile				
	3rd	Revision		2nd		Internal Viva
	4th	Revision				