

**Name of the Faculty** : VISITING FACULTY  
**Discipline** : Civil Engg.  
**Semester** : 5<sup>th</sup> Semester  
**Subject** : SOIL & FOUNDATION ENGG  
**Lesson Plan Duration** : 15 weeks

Week	Theory		Practical	
	Lecture Day	Topic (including assignment / test)	Practical Day	Topic
1.	1.	1. Introduction: 1.1 Importance of soil studies in Civil Engineering, Scope of Soil Mechanics in Civil Engg.	1.	1. To determine the Moisture content of a given sample of soil.
	2.	1.2 Geological origin of soils, soil profiles in India: residual and transported soil, alluvial deposits, lake deposits, local soil found in J&K, dunes and loess, glacial deposits, black cotton soils, conditions in which above deposits are formed.		
	3.	1.3 Names of organizations dealing with soil engineering work in India, soil map of India, classification of Soil as per major deposits in India.		
	4.	2. Physical Properties of Soils: 2.1 Constituents of soil and phase diagram		
2.	1.	2.2 Definitions of void ratio, porosity, water content, degree of saturation, specific gravity, unit weight, bulk density/bulk unit weight, dry unit weight,	2.	2. Auger Boring and Standard Penetration Test a) Identifying the equipment and accessories b) Conducting boring and SPT at a given location c) Collecting soil samples and their identification d) Preparation of boring log and SPT graphs e) Interpretation of test results
	2.	saturated unit weight and submerged unit weight of soil grains and correlation between them		
	3.	2.3 Simple numerical problems on phase diagrams		

	4	3. Classification and Identification of Soils 3.1. Particle size, shape and their effect on engineering properties of soil, particle size classification of soils 3.2 Gradation and its influence on engineering properties		
3.	1.	3.3 Relative density and its use in describing cohesionless soils 3.4 Behaviour of cohesive soils with change in water content, Atterberg's limit - definitions, use and practical significance	3.	3. Extraction of Disturbed and Undisturbed Samples a) Extracting a block sample b) Extracting a tube sample c) Extracting a disturbed samples for mechanical analysis. d) Field identification of samples
	2.	3.5 Field identification tests for soils 3.6 Soil classification system as per BIS 1498; basis, symbols, major divisions and sub divisions, groups, plasticity chart; procedure for classification of a given soil		
	3.	4. Flow of Water Through Soils: (04 hrs) 4.1 Concept of permeability and its importance 4.2 Darcy's law, coefficient of permeability, seepage velocity and factors affecting permeability		
	4.	4.3 Comparison of permeability of different soils as per BIS		
4.	1.	4.4 Measurement of permeability in the laboratory	4.	4. Field Density Measurement (Sand Replacement and Core Cutter Method) a) Calibration of sand b) Conducting field density test at a given location c) Determination of water content d) Computation and interpretation of results
	2.	5. Effective Stress: (Concept only) 5.1 Stresses in subsoil 5.2 Definition and meaning of total stress, effective stress and neutral stress and their interrelationships.		
	3.	5.3 Principle of effective stress.		
	4.	5.4 Importance of effective stress in engineering problems		

5.	1.	REVISION	5.	5. Liquid Limit and Plastic Limit Determination: a) Identifying various grooving tools b) Preparation of sample c) Conducting the test d) Observing soil behaviour during tests e) Computation, plotting and interpretation of results
	2.	FIRST SESSIONAL		
	3.	6. Deformation of Soils 6.1 Meaning, conditions/situations of occurrence with emphasis on practical significance of: a) Consolidation and settlement b) Creep c) Plastic flow		
	4	d) Heaving e) Lateral movement f) Freeze and thaw of soil		
6.	1.	6.2 Definition and practical significance of compression index, coefficient of consolidation, degree of consolidation. 6.3 Meaning of total settlement, uniform settlement and differential settlement; rate of settlement and their effects	6.	6. Mechanical Analysis a) Preparation of sample b) Conducting sieve analysis c) Computation of results d) Plotting the grain size distribution curve e) Interpretation of the curve
	2.	6.4 Settlement due to construction operations and lowering of water table 6.5 Tolerable settlement for different structures as per BIS		
	3.	7. Shear Strength Characteristics of Soils: 7.1. Concept and Significance of shear strength		
	4	DO		
	1.	DO		REVISION

7.	2.	7.2 Factors contributing to shear strength of cohesive and cohesion less soils, Coulomb's law and application in soil mechanics.	7.	
	3.	7.3 Examples of shear failure in soils		
	4	DO		
8.	1.	DO	8.	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
	2.	8. Compaction: 8.1 Concept and necessity of compaction and consolidation.		
	3.	8.2 Laboratory compaction test (standard and modified proctor test as per BIS) definition and importance of optimum water content, maximum dry density; moisture dry density relationship for typical soils with different compactive efforts		
	4	8.3. Compaction control; Density control, measurement of field density by core cutter method and sand replacement method, moisture control, Proctor's needle and its use, thickness control, jobs of an embankment supervisor in relation to compaction		
9.	1.	9. Soil Exploration:	9.	8. Demonstration of Unconfined
		9.1 Purpose and necessity of soil exploration		Compression Test a) Specimen preparation b) Conducting the test c) Plotting the graph d) Interpretation of results and finding/bearing capacity
	2.	DO		

	3.	9.2 Reconnaissance, methods of soil exploration, Trial pits, borings (auger, wash, rotary, percussion to be briefly dealt)		
	4	DO		
10.	1.	9.3 Sampling; undisturbed, disturbed and representative samples; selection of type of sample; thin wall and piston samples; area ratio,	10.	REVISION
	2.	recovery ratio of samples and their significance, number and quantity of samples, resetting, Sealing and preservation of samples.		
	3.	9.4 Presentation of soil investigation results		
	4.	REVISION		
11.	1.	SECOND SESSIONAL	11.	9. Demonstration of: a) Direct Shear and Vane Shear Test on sandy soil samples b) Permeability test apparatus
	2.	10 Bearing Capacity of soil 10.1 Concept of bearing capacity		
	3	10.2 Definition and significance of ultimate bearing capacity, net safe bearing capacity and allowable bearing pressure		
	4	10.3 Guidelines of BIS (IS 6403) for estimation of bearing capacity of soil		
12.	1.	10.4 Factors affecting bearing capacity	12.	
	2.	10.5 Concept of vertical stress distribution in soils due to foundation loads, pressure bulb		
	3.	10.6 Applications of SPT, unconfined compression test and direct shear test in estimation of bearing capacity		
	4	10.7 Plate load test and its limitations		
13.	1.	10.8 Improvement of bearing capacity by sand drain method, compaction, use of geosynthetics.	13.	REVISION
	2.	11. Foundation Engineering: Concept of shallow and deep foundation;		
	3.	types of shallow foundations:		

	4.	Isolated, combined, strip, mat, and their suitability.		
14.	1.	Factors affecting the depth of shallow foundations, deep foundations, type of piles and their suitability;	14.	REVISION
	2.	Pile classification on the basis of material, pile group and pile cap.		
	3.	REVISION		
	4.	THIRD SESSIONAL		
15.	1.	PREPARATION FOR FINAL EXAM	15.	REVISION
	2.	DO		
	3.	DO		
	4.	DO		

Name of the Faculty : VISITING FACULTY

Discipline : Civil Engineering

Semester : 5th

Subject : Environmental Education

Lesson Plan Duration : 15 Weeks

Week	Theory	
	Lecture Day	Topic (including assignment / test)
1 <sup>st</sup>	1	1. Definition, Scope and Importance of Environmental Education
	2	DO
	3	2. Basics of ecology,
2 <sup>nd</sup>	1	biodiversity,
	2	eco system and sustainable development
	3	3. Sources of pollution - natural and manmade,
3 <sup>rd</sup>	1	causes,
	2	effects
	3	and control measures of pollution (air, water, noise, soil, radioactive
4 <sup>th</sup>	1	DO
	2	DO
	3	DO
5 <sup>th</sup>	1	DO
	2	REVISION
	3	FIRST SESSIONAL
6 <sup>th</sup>	1	4. Solid waste management – Causes,
	2	effects
	3	and control measures of urban and industrial waste
7 <sup>th</sup>	1	DO
	2	DO
	3	5. Mining and deforestation – Causes,
8 <sup>th</sup>	1	effects
	2	and control measures
	3	DO
9 <sup>th</sup>	1	6. Environmental Legislation - Water (prevention and control of pollution) Act 1974,
	2	Air (Prevention and Control of Pollution) Act 1981

	3	and Environmental Protection Act 1986,
10th	1	Role and Function of State Pollution Control Board
	2	Environmental Impact Assessment (EIA)
	3	DO
11th	1	REVISION
	2	SECOND SESSIONAL
	3	7. Role of Non-conventional Energy Resources (Solar Energy, Wind Energy, Bio Energy, Hydro Energy)
12th	1	DO
	2	DO
	3	DO
13th	1	8. Current Issues in Environmental Pollution – Global Warming,
	2	Green House Effect, Depletion of Ozone Layer,
	3	Recycling of Material, Environmental Ethics,
14th	1	Rain Water Harvesting, Maintenance of Groundwater,
	2	Acid Rain, Carbon Credits.
	3	REVISION
15th	1	THIRD SESSIONAL
	2	PREPARATION FOR FINAL EXAM
	3	PREPARATION FOR FINAL EXAM



**Name of the Faculty** : VISITING FACULTY  
**Discipline** : Civil Engineering  
**Semester** : 5th  
**Subject** : EMPLOYABILITY SKILLS – I  
**Lesson Plan Duration** : 15 Weeks

Week	Practical	
	Practical Day	Topic
1st	1st	1. Writing skills i) Official and business correspondence
2nd	2nd	DO
3rd	3rd	ii) Job application - covering letter and resume
4th	4th	iii) Report writing - key features and kinds
5th	5th	2. Oral Communication Skills (20 hrs) i) Giving advice
6th	6th	ii) Making comparisons
7th	7th	iii) Agreeing and disagreeing
8th	8th	iv) Taking turns in conversation
9th	9th	v) Fixing and cancelling appointments
10th	10th	3. Generic Skills i) Stress management
11th	11th	DO
12th	12th	ii) Time management
13th	13th	iii) Negotiations and conflict resolution
14th	14th	iv) Team work and leadership qualities
15th	15th	REVISION

Name of the Faculty : VISITING FACULTY

Discipline : CIVIL ENGG.

Semester : 5th sem

Subject : STEEL STRUCTURES DESIGN

Lesson Plan Duration : 15 weeks(from July 2018 to Nov. 2018)

Work Load (lecture/practical)per week (in hours) : Lectures- 10, practical- 12

Week	Theory		Practical	
	Lecture Day	Topic(including assignment/test)	Practical Day	Practical Topic
1	1	Structural Steel and Sections: Properties of structural steel as per IS Code	1	Drawing No. 1: RC Slabs - One way slab, Two way slab and Cantilever Slab.
	2	Structural Steel and Sections: Properties of structural steel as per IS Code	2	
	3	Designation of structural steel sections as per IS handbook and IS:800 - 2007	3	
	4	Designation of structural steel sections as per IS handbook and IS:800 - 2007	4	Drawing No. 1: RC Slabs - One way slab, Two way slab and Cantilever Slab.
	5	Revision	5	
2	6	Riveted Connections: Types of rivets, permissible stresses in rivets, types of riveted joints,	7	Drawing No.2 : Beams - Singly and doubly reinforced rectangular beams and Cantilever beam (All beams with vertical stirrups)
	7	Riveted Connections: Types of rivets, permissible stresses in rivets, types of riveted joints,	8	
	8	specifications for riveted joints as per IS 800. Failure of a riveted joint.	9	
	9	Assumptions in the theory of riveted joints. Strength and efficiency of a riveted joint.	10	Drawing No.2 : Beams - Singly and doubly reinforced rectangular beams and Cantilever beam (All beams with vertical stirrups)
	10	Design of riveted joints for axially loaded members ( No Staggered	11	
			12	
3	11	Revision	13	

	12	Bolted and Welded connections: Types of bolts and bolted joints, specifications for bolted joints as per IS: 800 - 2007	14	Drawing No.3 : Columns and Footings – Square, Rectangular and Circular Columns with lateral ties and their isolated sloped column footings.
	13	Types of welds and welded joints, advantages and disadvantages of welded joints and bolted joints	15	
	14	design of fillet and butt weld. Plug and slot welds (Descriptive No numerical on plug and slot welds)	16	Drawing No.3 : Columns and Footings – Square, Rectangular and Circular Columns with lateral ties and their isolated sloped column footings.
	15	Revision	17 18	
4	16	Revision	19	Drawing No. 4 : Portal Frame – Three bay two storey RC portal frame with blow up of column beam junctions.
	17	1st Sessional Test	20	
	18	Tension Members:- Analysis and design of single and double angle section tension members	21	
	19	Tension Members:- Analysis and design of single and double angle section tension members	22	
	20	Riveted and welded connections with gusset plate as per IS:800	23 24	Drawing No. 4 : Portal Frame – Three bay two storey RC portal frame with blow up of column beam junctions.
	21	Revision	25	Drawing No.5: Dog legged stairs for single storey building
22	Compression Members:-Analysis and design of single and double angle sections compression members (struts)	26		
23	Compression Members:-Analysis and design of single and double angle sections compression members (struts)	27		
	24	their welded connections with gusset plate as per IS:800	28	Drawing No.5: Dog legged stairs for single storey building
	25	Revision	29 30	
	26	Roof Trusses:- Form of trusses, pitch of roof truss,	31	
6				Drawing No.6 : Draw atleast one sheet using CAD software

	27	spacing of trusses,	32	
	28	spacing of purlins	33	
	29	Connection between purlin and roof covering.	34	Drawing No.6 : Draw atleast one sheet using CAD software
	30	Connection between purlin and principal rafter (no design, only	35	
			36	
7	31	Columns:-Concept of buckling of columns, effective length and slenderness ratio,	37	Drawing No. 1: Roof Truss – Drawing of Fink Roof Truss with details of joints, fixing details of purlins and roof sheets.
	32	permissible stresses in compression as per IS:800 for different end conditions.	38	
	33	Analysis and Design of axially loaded single section steel column	39	
	34	Types of column bases (Descriptive only)	40	Drawing No. 1: Roof Truss – Drawing of Fink Roof Truss with details of joints, fixing details of purlins and roof sheets.
	35	Beam and column, frame and seated connections (descriptive only, no	41	
			42	
8	36	Columns:-Concept of buckling of columns, effective length and slenderness ratio,	43	Drawing No.2 : Column and Column Bases - Drawing of splicing of steel columns. Drawings of slab base, gusseted base and grillage base for single section steel columns.
	37	permissible stresses in compression as per IS:800 for different end conditions.	44	
	38	Analysis and Design of axially loaded single section steel column	45	
	39	Types of column bases (Descriptive only)	46	Drawing No.2 : Column and Column Bases - Drawing of splicing of steel columns. Drawings of slab base, gusseted base and grillage base for single section steel columns.
	40	Beam and column, frame and seated connections (descriptive only, no design)	47	
			48	
9	41	Revision	49	Drawing No.3 : Column Beam Connections (a) Sealed and Framed Beam to Beam Connections
	42	Revision	50	
	43	Revision	51	
	44	Revision	52	Drawing No.3 : Column Beam Connections (a) Sealed and Framed Beam to Beam Connections
	45	2nd sessional test	53	
			54	
10	46	Beams:- Analysis and design of single section simply supported laterally restrained steel beams.	55	

	47	Beams:- Analysis and design of single section simply supported laterally restrained steel beams.	56	(b) Sealed and Framed beam o Column Connections
	48	Introduction to plate girder and functions of various elements of a plate girder	57	
	49	Introduction to plate girder and functions of various elements of a plate girder	58	(b) Sealed and Framed beam o Column Connections
	50	Revision	59 60	
11	51	Beams:- Analysis and design of single section simply supported laterally restrained steel beams.	61	Drawing No. 4 : Plate Girder Plan and Elevation of Plate Girder with details at supports and connection of stiffness, flange angles and cover plate with web highlighting curtailment of plates.
	52	Beams:- Analysis and design of single section simply supported laterally restrained steel beams.	62	
	53	Introduction to plate girder and functions of various elements of a plate girder	63	
	54	Introduction to plate girder and functions of various elements of a plate girder	64	Drawing No. 4 : Plate Girder Plan and Elevation of Plate Girder with details at supports and connection of stiffness, flange angles and cover plate with web highlighting curtailment of plates.
	55	Revision	65 66	
12	56	Fabrication and Erection of Steel Structures like trusses, columns and girders	67	Drawing No. 5 : Draw atleast one sheet using CAD software
	57	Fabrication and Erection of Steel Structures like trusses, columns and girders	68	
	58	Fabrication and Erection of Steel Structures like trusses, columns and girders	69	
	59	Fabrication and Erection of Steel Structures like trusses, columns and girders	70	Drawing No. 5 : Draw atleast one sheet using CAD software
	60	Revision	71 72	

13	61	Masonry structures – Design of brick column and wall foundations	73	Sheet checking and viva
	62	Masonry structures – Design of brick column and wall foundations	74	Sheet checking and viva
	63	Masonry structures – Design of brick column and wall foundations	75	Sheet checking and viva
	64	Masonry structures – Design of brick column and wall foundations	76	Sheet checking and viva
	65	Revision	77	Sheet checking and viva
			78	Sheet checking and viva
14	66	Revision	79	Sheet checking and viva
	67	Revision	80	Sheet checking and viva
	68	Revision	81	Sheet checking and viva
	69	Revision	82	Sheet checking and viva
	70	Revision	83	Sheet checking and viva
			84	Sheet checking and viva
15	71	Viva	85	Sheet checking and viva
	72	Viva	86	Sheet checking and viva
	73	Viva	87	Sheet checking and viva
	74	Viva	88	Sheet checking and viva
	75	3rd sessional test	89	Sheet checking and viva
			90	Sheet checking and viva