

Name of the Faculty :
Discipline : Civil Engineering
Semester : 5th
Subject : Environmental Education
Lesson Plan Duration : 15 Weeks

Week	Theory	
	Lecture Day	Topic (including assignment / test)
1 st	1	1. Definition, Scope and Importance of Environmental Education
	2	DO
	3	2. Basics of ecology,
2 nd	1	biodiversity,
	2	eco system and sustainable development
	3	3. Sources of pollution - natural and manmade,
3 rd	1	causes,
	2	effects
	3	and control measures of pollution (air, water, noise, soil, radioactive and nuclear) and their units of measurement.
4 th	1	DO
	2	DO
	3	DO
5 th	1	DO
	2	REVISION
	3	FIRST SESSIONAL
6 th	1	4. Solid waste management – Causes,
	2	effects
	3	and control measures of urban and industrial waste
7 th	1	DO
	2	DO
	3	5. Mining and deforestation – Causes,
8 th	1	effects
	2	and control measures
	3	DO
9 th	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,
10 th	1	Role and Function of State Pollution Control Board
	2	Environmental Impact Assessment (EIA)
	3	DO
11 th	1	REVISION
	2	SECOND SESSIONAL
	3	7. Role of Non-conventional Energy Resources (Solar Energy, Wind Energy, Bio Energy, Hydro Energy)
12 th	1	DO
	2	DO
	3	DO
13 th	1	8. Current Issues in Environmental Pollution – Global Warming,
	2	Green House Effect, Depletion of Ozone Layer,
	3	Recycling of Material, Environmental Ethics,
14 th	1	Rain Water Harvesting, Maintenance of Groundwater,
	2	Acid Rain, Carbon Credits.
	3	REVISION
15 th	1	THIRD SESSIONAL
	2	PREPARATION FOR FINAL EXAM
	3	PREPARATION FOR FINAL EXAM

Name of the Faculty :
Discipline : **Civil Engineering**
Semester : **5th**
Subject : **Steel Structure Design**
Lesson Plan Duration : **15 Weeks**

Week	Theory	
	Lecture Day	Topic (including assignment / test)
1 st	1	1. Structural Steel and Sections: 1.1 Properties of structural steel as per IS Code 1.2 Designation of structural steel sections as per IS handbook and IS:800 - 2007
	2	2. Riveted Connections: Types of rivets, permissible stresses in rivets, types of riveted joints, specifications for riveted joints as per IS 800. Failure of a riveted joint.
	3	DO
	4	Assumptions in the theory of riveted joints. Strength and efficiency of a riveted joint. Design of riveted joints for axially loaded members (No Staggered riveting).
	5	DO
2 nd	1	DO
	2	DO
	3	DO
	4	3. Bolted and Welded connections: 3.1 Types of bolts and bolted joints, specifications for bolted joints as per IS: 800 - 2007
	5	3.2 Types of welds and welded joints, advantages and disadvantages of welded joints and bolted joints design of fillet and butt weld. Plug and slot welds (Descriptive No numerical on plug and slot welds)
3 rd	1	DO
		DO
	2	DO
	3	4. Tension Members Analysis and design of single and double angle section tension members and their rivetted and welded connections with gusset plate as per IS:800
	4	DO
	5	DO
4 th	1	DO
	2	DO
		DO

	3	DO
	4	DO
	5	REVISION
5 th	1	FIRST SESSIONAL
	2	5. Compression Members Analysis and design of single and double angle sections compression members (struts) and their welded connections with gusset plate as per IS:800
	3	DO
	4	DO
	5	DO
6 th	1	DO
	2	DO
	3	DO
	4	DO
	5	DO
7 th	1	6. Roof Trusses Form of trusses, pitch of roof truss, spacing of trusses, spacing of purlins, connection between purlin and roof covering.
	2	DO
	3	DO
	4	Connection between purlin and principal rafter (no design, only concept)
	5	DO
8 th	1	7. Columns: 7.1 Concept of buckling of columns, effective length and slenderness ratio,
	2	DO
	3	DO
	4	Permissible stresses in compression as per IS:800 for different end conditions. Analysis and Design of axially loaded single section steel column
	5	DO
9 th	1	DO
	2	7.2 Types of column bases (Descriptive only)
	3	7.3 Beam and column, frame and seated connections

		(descriptive only, no design)
	4	DO
	5	DO
10 th	1	REVISION
	2	SECOND SESSIONAL
	3	8. Beams Analysis and design of single section simply supported laterally restrained steel beams.
	4	DO
	5	DO
		DO
11 th	1	DO
	2	DO
	3	DO
	4	DO
	5	Introduction to plate girder and functions of various elements of a plate girder
12 th	1	DO
	2	DO
	3	DO
	4	9 Fabrication and Erection of Steel Structures like trusses, columns and girders
	5	DO
13 th	1	DO
	2	DO
	3	DO
	4	10 Masonry structures – Design of brick column and wall foundations
	5	DO
14 th	1	DO
	2	REVISION
	3	THIRD SESSIONAL
	4	PREPARATION FOR FINAL EXAM
	5	DO
15 th	1	DO
	2	DO
	3	DO
	4	DO
	5	DO

Name of the Faculty : G.P.SINGH
Discipline : Civil Engg.
Semester : 5thSemester
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	1.	1. To determine the Moisture content of a given sample of soil.
	2.	1.2 Geological origin of soils with special reference to 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 and their engineering characteristics.		
	3.	1.3 Names of organizations dealing with soil engineering work in India, soil map of India		
	4.	2. Physical Properties of Soils: 2.1 Constituents of soil and representation by a 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 with the		

		help of 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. 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. 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	

	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		

7.	1.	DO	7.	REVISION
	2.	7.2 Factors contributing to shear strength of cohesive and cohesion less soils, Coulomb's law		
	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 Definition and necessity of compaction		
	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		REVISION
	3.	10.6 Applications of SPT, unconfined compression test and direct shear test in estimation of bearing capacity		
	4	10.7 Plate load test (no procedure details) and its limitations		
13.	1.	10.8 Improvement of bearing capacity by sand drain method, compaction, use of geo-synthetics.	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 :
Discipline : **Civil Engg.**
Semester : **5thSemester**
Subject : **HIGHWAY ENGG**
Lesson Plan Duration : **15 weeks**

Week	Theory		Practical	
	Lecture Day	Topic (including assignment / test)	Practical Day	Topic
1.	1.	1. Introduction (02 hrs) 1.1 Importance of Highway engineering 1.2 Functions of IRC, CRRI, MORT&H, NHAI	1.	Brief Introduction to Practical's
	2.	1.3 IRC classification of roads		
	3.	2. Road Geometrics (10 hrs) 2.1 Glossary of terms used in road geometrics and their importance: Right of way, formation width, road margin, road shoulder, carriage way, side slopes, kerbs, formation levels, camber and gradient		
	4	DO		
	5	2.2 Average running speed, stopping and passing sight distance		
2.	1.	DO	2.	1. Determination of penetration value of bitumen
	2.	2.3 Necessity of curves, horizontal and vertical curves including transition curves. Super elevation and methods of providing super elevation		
	3.	DO		
	4	DO		
	5	2.4 Sketch of typical cross-sections in cutting and filling on straight alignment and at a curve		
3.	1.	3. Highway Surveys and Plan 3.1 Topographic map, reading the data given on a topographic map	3.	2. Determination of softening point of bitumen

	2.	DO	
	3.	3.2 Basic considerations governing alignment for a road in plain and hilly area	
	4.	DO	
	5	DO	
4.	1.	3.3 Highway location; marking Of alignment	4.
	2.	DO	
	3.	4. Road Materials 4.1 Different types of road materials in use; soil, aggregate,	
	4.	binders – bitumen, cutback, Emulsion and Modified Bitumen (CRMB, PMB)	
	5	4.2 Binders: Common binders; bitumen, properties as per BIS specifications, penetration,	
5.	1.	softening point, ductility and viscosity test of bitumen, procedures and significance,	5.
	2.	cut back and emulsion and their uses,	
	3.	Bitumen modifiers	
	4	REVISION	
	5	FIRST SESSIONAL	
6.	1.		6.
			5. Determination of abrasion value (Los Angeles') of road aggregate

	2.	5. Road Pavements 5.1 Road pavement: Flexible and rigid pavement, their merits and demerits, typical cross-sections, functions of various components		
	3.	5.2. Introduction to California Bearing Ratio, method of finding CBR value and its significance. Aggregate : Source and types, important properties, strength, durability		
	4	5.3 Sub-grade preparation: Setting out alignment of road, setting out bench marks, control pegs for embankment and cutting, borrow pits, making profiles of embankment, construction of embankment, compaction, preparation of subgrade		
	5	, methods of checking camber, gradient and alignment as per recommendations of IRC, equipment used for subgrade preparation. Stabilization of subgrade. Types of stabilization mechanical stabilization, lime stabilization, cement stabilization, fly ash stabilization etc.(introduction only)		
7.	1.	5.4 Introduction to Sub Base Course and Base Course: a) Granular base course: (i) Water Bound Macadam (WBM) (ii) Wet Mix Macadam (WMM)	7.	6. Determination of the California bearing ratio (CBR) for the sub-grade soil
	2.	b) Bitumen Courses: (i) Bituminous Macadam (ii) Dense Bituminous Macadam (DBM) c) *Methods of construction as per MORT&H		
	3.	5.5 Surfacing: a) * Types of surfacing i) Prime coat and tack coat ii) Surface dressing with seal coat iii) Open graded premix carpet iv) Mix seal surfacing v) Semi dense bituminous concrete		
	4	vi) Bituminous Concrete/Asphaltic concrete vii) Mastic Asphalt		
	5	b) Methods of constructions as per MORT&H specifications and quality		

		control..	
8.	1.	5.6 Rigid Pavements: Construction of concrete roads as per IRC specifications: Form work laying, mixing and placing the concrete, compacting and finishing,	8.
	2.	curing, joints in concrete pavement, equipment used	
	3.	6. Hill Roads: 6.1 Introduction: Typical cross-sections showing all details of a typical hill road, partly in cutting and partly in filling	
	4	DO	
	5	6.2 Special problems of hill areas 6.2.1 Landslides: Causes, prevention and control measures, use of geogrids, geoflexiles, geosynthetics	
9.	1.	6.2.2 Drainage 6.2.3 Soil erosion	9.
	2.	6.2.4 Snow: Snow clearance, snow avalanches, frost 6.2.5 Land Subsidence	
	3.	7. Road Drainage: 7.1 Necessity of road drainage work, cross drainage works	
	4	7.2 Surface and subsurface drains and storm water drains. Location,	
	5	Spacing and typical details of side drains, side ditches for surface drainage. Intercepting drains, pipe drains in hill roads, details of drains in cutting embankment, typical cross sections	
			7. Visit to Hot mix plant
			8. Visit to highway construction site for demonstration of operation of: Tipper, tractors (wheel and crawler), scraper, bulldozer, dumpers, shovels, grader, roller, dragline, road pavers, JCB etc.

10.	1.	8. Road Maintenance: (06 hrs) 8.1 Common types of road failures of flexible pavements: Pot hole, rutting, alligator cracking, upheaval - their causes and remedies (brief description)	10.	9. Mixing and spraying equipment
	2.	8.2 Maintenance of bituminous road such as seal-coat, patch-work and recarpetng.		
	3.	8.3 Maintenance of concrete roads- filling cracks, repairing joints,		
	4.	maintenance of shoulders (berms), maintenance of traffic control devices		
	5	REVISION		
11.	1.	SECOND SESSIONAL	11.	10 A compulsory visit to Ready Mix Concrete plant.
	2.	9. Road Construction Equipment: Output and use of the following plant and equipment 9.1 Hot mix plant		
	3	9.2 Tipper, tractors (wheel and crawler) scraper,		
	4	bulldozer, dumpers, shovels, grader, roller, dragline		
	5	9.3 Asphalt mixer		
12.	1.	and tar boilers	12.	REVISION
	2.	9.4 Road pavers		
	3.	10 Airport Engineering :- 10.1 Necessity of study of airport engineering, aviation transport scenario in India.		
	4	DO		

	5			
		DO		
13.	1.	10.2 Factors to be considered while selecting a site for an airport with respect to zoning laws.	13.	REVISION
	2.			
		DO		
	3.	10.3 Introduction to Runways,		
	4.	Taxiways		
	5	and Apron		
14.	1.		14.	REVISION
		REVISION		
	2.			
		THIRD SESSIONAL		
	3.	PREPARATION FOR FINAL EXAM		
	4	DO		
	5	DO		
15.	1.	DO	15.	REVISION
	2.	DO		
	3.	DO		
	4.	DO		
	5	DO		

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

Name of the Faculty :
Discipline : Civil Engg.
Semester : 5th Sem.
Subject : Structural Drawing
Lesson Plan Duration : 15 weeks

Week	Theory		Practical	
	Lecture Day	Topic (including assignment / test)	Practical Day	Topic
1			1.	1. RC Structures: Reinforcement details from the given data for the following structural elements with bar bending schedules (i) Drawing No. 1: RC Slabs - One way slab, Two way slab and Cantilever Slab.
			2.	DO
2.			3.	(ii) Drawing No.2 : Beams - Singly and doubly reinforced rectangular beams and Cantilever beam (All beams with vertical stirrups)
			4.	DO
3.			5.	(iii) Drawing No.3 : Columns and Footings – Square, Rectangular and Circular Columns with lateral ties and their isolated sloped column footings.
			6.	DO
4.			7.	(iv) Drawing No. 4 : Portal Frame – Three bay two storey RC portal frame with blow up of column beam junctions.
			8.	DO
5.			9.	(v) Drawing No.5: Dog legged stairs for single storey building

			10.	(vi) Drawing No.6 : Draw atleast one sheet using CAD software
6.			11.	FIRST SESSIONAL
			12.	2. Steel Structures: Structural drawing from given data for following steel structural elements. (i) Drawing No. 1: Roof Truss – Drawing of Fink Roof Truss with details of joints, fixing details of purlins and roof sheets.
7.			13.	DO
			14.	(iii) Drawing No.3 : Column Beam Connections (a) Sealed and Framed Beam to Beam Connections (b) Sealed and Framed beam o Column Connections
8.			15.	DO
			16.	DO
9.			17.	(iv) 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.
			18.	DO
10.			19.	DO

			20.	(v) Drawing No. 5 : Draw atleast one sheet using CAD software
11.			21.	SECOND SESSIONAL
			22.	REVISION
12.			23.	REVISION
			24.	REVISION
13.			25.	REVISION
			26.	REVISION
14.			27.	THIRD SESSIONAL
			28.	PREPARATION FOR FINAL EXAM
15.			29.	PREPARATION FOR FINAL EXAM
			30.	PREPARATION FOR FINAL EXAM