Name of the Faculty:Discipline:Civil EngineeringLTPSubject:STEEL STRUCTURES DESIGNSemester: $5^{th}$ 5--

Lesson Plan Duration :

15 Weeks (from Jul-2018 to Dec-2018)

		Theory	Delivery Date	of Lecture	Whether the
Week	Lecture	Topic	Expected	Actual	Lesson Plan Followed?
	Day	(including Assignments / Seminar / Group Discussion / Sessional Tests)			Yes/No
	1 <sup>st</sup>	Introduction to the subject and its necessity			
	- nd	e-Lecture/Video Lecture/PPT's on the subject matters			
	2"	Unit 1: Structural Steel and Sections (02 Hrs)			
a st	e rd	e-Lecture/Video Lecture/PPT's on concept of Structural Steel and Sections			
1"	3"	Properties of structural steel as per IS Code			
	th	Designation of structural steel sections as per IS handbook and IS:800 - 2007			
	4 <sup>th</sup>	Unit 2: Riveted Connections (10 Hrs)			
	<b>-</b> th	Types of rivets, permissible stresses in rivets,			
	5 <sup>m</sup>	Types of riveted joints,			
	1 <sup>st</sup>	Assumptions in the theory of riveted joints, Specifications for riveted joints as per IS 800.			
nd	2 <sup>nd</sup>	Failure of a riveted joint.			
2 <sup>nd</sup>	314	Strength and efficiency of a riveted joint.			
	4 <sup>th</sup>	Design of riveted joints for axially loaded members (No Staggered riveting).			
	$5^{\text{th}}$	Numerical Problems Practice			
	$1^{st}$	Numerical Problems Practice			
	$2^{nd}$	Numerical Problems Practice			
2rd	$3^{\rm rd}$	Numerical Problems Practice			
5	$4^{\text{th}}$	Unit 3: Bolted and Welded connections (06 Hrs)			
		Types of bolts and bolted joints, specifications for bolted joints as per IS: 800 - 2007			
	5 <sup>th</sup>	Types of welds and welded joints,			
	$1^{st}$	advantages and disadvantages of welded joints and bolted joints			
	2 <sup>nd</sup>	design of fillet weld : Numerical Problems Practice			
$4^{\text{th}}$	3 <sup>rd</sup>	Numerical Problems Practice			
	$4^{\text{th}}$	design of butt weld : Numerical Problems Practice			
	$5^{\text{th}}$	Numerical Problems Practice			
5 <sup>th</sup>	$1^{st}$	Plug and slot welds (Descriptive No numerical on plug and slot welds) Assignment - 1			

	$2^{nd}$	Sessional Test – 1		
	$3^{rd}$	Group discussion / Technical Quiz / Seminar		
	4 <sup>th</sup>	Unit 4: Tension Members (16 Hrs)		
		Analysis and design of single and double angle section tension members and their rivetted and		
		welded connections with gusset plate as per IS:800		
	$5^{\text{th}}$	Analysis and design of single angle section tension members as per IS:800		
	1 <sup>st</sup>	Analysis and design of double angle section tension members as per IS:800		
	$2^{na}$	Numerical Problems Practice		
$6^{th}$	$3^{\rm rd}$	Analysis and design of single angle section tension members and their riveted connections as per IS:800		
	$4^{\text{th}}$	Analysis and design of single angle section tension members and their welded connections as per IS:800		
	5 <sup>th</sup>	Numerical Problems Practice		
	$1^{st}$	Analysis and design of double angle section tension members and their riveted connections as per IS:800		
	$2^{nd}$	Analysis and design of double angle section tension members and their welded connections as per IS:800		
7 <sup>th</sup>	3 <sup>rd</sup>	Numerical Problems Practice		
,	$4^{\text{th}}$	Analysis and design of single and double angle section tension members and their rivetted and welded		
	-th	connections with gusset plate as per IS:800		
	5 <sup>th</sup>	Numerical Problems Practice		
	1 <sup>st</sup>	Numerical Problems Practice		
	2	Unit 5: Compression Members (16 Hrs)		
		Analysis and design of single and double angle sections compression members (struts) and their		
$8^{th}$	2 <sup>rd</sup>	weided connections with gusset plate as per 15:800		
	3	Analysis and design of single angle sections compression members (struts) as per IS:800		
	4	Analysis and design of single angle sections compression members (struts) and their welded connections		
	– th	with gusset plate as per IS:800		
	5 <sup></sup>	Numerical Problems Practice		
	2 <sup>nd</sup>	Numerical Problems Practice		
		Analysis and design of double angle sections compression members (struts) as per IS:800		
9 <sup>th</sup>	314	Analysis and design of double angle sections compression members (struts) and their welded connections		
	. th	with gusset plate as per IS:800		
	4 <sup>th</sup>	Numerical Problems Practice Assignment - 2	·	
	5 <sup>m</sup>	Numerical Problems Practice	┟─────┤	
	l <sup>n</sup>	Sessional Test – 2		
$10^{\text{th}}$	2 <sup>rd</sup>	Group discussion / Technical Quiz / Seminar		
	3"	Unit 6: Roof Trusses (06 Hrs)		
		Form of trusses,		

	$4^{\text{th}}$	pitch of roof truss, spacing of trusses,		
	$5^{\text{th}}$	spacing of purlins, connection between purlin and roof covering.		
	$1^{st}$	Connection between purlin and principal rafter (no design, only concept)		
	$2^{nd}$	e-Lecture/Video Lecture on Roof Trusses		
11 <sup>th</sup>	$3^{rd}$	Unit 7: Columns (10 Hrs)		
11		e-Lecture/Video Lecture on concept of Columns		
	4 <sup>th</sup>	Concept of buckling of columns, effective length and slenderness ratio,		
	$5^{\text{th}}$	Permissible stresses in compression as per IS: 800 for different end conditions.		
	1 <sup>st</sup>	Analysis and Design of axially loaded single section steel column		
	$2^{nd}$	Numerical Problems Practice		
$12^{\text{th}}$	3 <sup>rd</sup>	Types of column bases (Descriptive only)		
	4 <sup>th</sup>	Beam and column, frame and seated connections (descriptive only, no design)		
	$5^{\text{th}}$	Numerical Problems Practice		
	1 <sup>st</sup>	Numerical Problems Practice		
	$2^{nd}$	Unit 8: Beams (10 Hrs)		
13 <sup>th</sup>		e-Lecture/Video Lecture on concept of Beams		
15	3 <sup>rd</sup>	Analysis and design of single section simply supported laterally restrained steel beams.		
	$4^{\text{th}}$	Numerical Problems Practice		
	$5^{\text{th}}$	Numerical Problems Practice		
	1 <sup>st</sup>	Numerical Problems Practice		
	$2^{nd}$	Introduction to plate girder and functions of various elements of a plate girder		
$14^{\text{th}}$	3 <sup>rd</sup>	Numerical Problems Practice		
11	$4^{\text{th}}$	Numerical Problems Practice		
	$5^{\text{th}}$	Unit 9: Fabrication and Erection of Steel Structures (02 Hrs)		
	-4	e-Lecture/Video Lecture on concept of Fabrication and Erection of Steel Structures		
	1 <sup>st</sup>	Group discussion / Technical Quiz / Seminar		
	$2^{nd}$	Fabrication and Erection of Steel Structures like trusses, columns and girders		
15 <sup>th</sup>	$3^{rd}$	Unit 10: Fabrication and Erection of Steel Structures (02 Hrs)		
10	th	e-Lecture/Video Lecture on concept of Masonry structures		
	4 <sup>th</sup>	Masonry structures - Design of brick column and wall foundations		
	$5^{\text{th}}$	Sessional Test – 3		

Name of the Faculty	:		Discipline	:	Civil Engineering	L	Т	Р
Subject	:	HIGHWAY ENGINEERING	Semester	:	5 <sup>th</sup>	5	-	-

Lesson Plan Duration : 15 Weeks (from Jul-2018 to Dec-2018)

		Theory	Delivery Date	of Lecture	Whether the
Week	Lecture	Торіс	Eurostad	A street	Lesson Plan Followed?
	Day	(including Assignments / Seminar / Group Discussion / Sessional Tests)	Expected	Actual	Yes/No
	1 <sup>st</sup>	Introduction to the subject and its necessity			
		e-Lecture/Video Lecture on the subject matters			
	$2^{nd}$	Unit 1: Introduction (02 Hrs)			
-1		Importance of Highway engineering, Functions of IRC, CRRI, MORT&H, NHAI			
$1^{st}$	3 <sup>rd</sup>	IRC classification of roads			
	$4^{\text{th}}$	Unit 2: Road Geometrics (10 Hrs)			
		e-Lecture/Video Lecture on the Road Geometrics			
	$5^{\text{th}}$	Glossary of terms used in road geo-metrics and their importance: Right of way, formation width, road			
	-4	margin, road shoulder, carriage way,			
	$1^{st}$	Glossary of terms used in road geo-metrics and their importance: carriage way, side slopes, kerbs,			
	- nd	formation levels, camber and gradient			
nd	2 <sup>nd</sup>	Average running speed, stopping and passing sight distance			
$2^{na}$	3 <sup>10</sup>	Necessity of curves, horizontal and vertical curves including transition curves. Super elevation and			
	. th	methods of providing super elevation			
	4 <sup>th</sup>	e-Lecture/Video Lecture on the Curves			
	5 <sup>th</sup>	Sketch of typical cross-sections in cutting and filling on straight alignment and at a curve			
	1 <sup>st</sup>	Group discussion / Quarries / Technical Quiz / Seminar			
	$2^{nd}$	Unit 3: Highway Surveys and Plan (10 Hrs)			
3rd		e-Lecture/Video Lecture on the concept of highway surveys and plans			
5	$3^{rd}$	Topographic map, reading the data given on a topographic map			
	$4^{\text{th}}$	Topographic map, reading the data given on a topographic map			
	5 <sup>th</sup>	Basic considerations governing alignment for a road in plain and hilly area			
	$1^{st}$	Basic considerations governing alignment for a road in plain and hilly area			
	$2^{nd}$	Highway location; marking of alignment			
$4^{\text{th}}$	3 <sup>rd</sup>	Highway location; marking of alignment			
	4 <sup>th</sup>	Quarries / Assignment -1			
	5 <sup>th</sup>	Unit 4: Road Materials (10 Hrs)			

		e-Lecture/Video Lecture on road materials		
	$1^{st}$	Different types of road materials in use; soil, aggregate,		
-th	$2^{nd}$	Different types of road materials in use; binders - bitumen, cutback, Emulsion and Modified Bitumen (CRMB, PMB)		
5"	$3^{rd}$	Binders: Common binders; bitumen, properties as per BIS specifications,		
	$4^{\text{th}}$	penetration, softening point, ductility and viscosity test of bitumen, procedures and significance,		
	$5^{\text{th}}$	Sessional Test -1		
	$1^{st}$	penetration, softening point, ductility and viscosity test of bitumen, procedures and significance,		
	$2^{nd}$	cut back and emulsion and their uses, Bitumen modifiers		
6 <sup>th</sup>	3 <sup>rd</sup>	cut back and emulsion and their uses, Bitumen modifiers		
0	$4^{\text{th}}$	Group discussion / Technical Quiz / Seminar		
	$5^{\text{th}}$	Unit 5: Road Pavements (12 Hrs)		
		e-Lecture/Video Lecture on concept of road pavements: Rigid and Flexible Pavements		
	$1^{st}$	Road pavement: Flexible pavement and Rigid pavement, their merits and demerits, typical cross-sections,		
	- nd	functions of various components	 	
	2"	Introduction to California Bearing Ratio, method of finding CBR value and its significance. Aggregate :		
		Source and types, important properties, strength, durability		
	ard	e-Lecture/ video Lecture on CDK	 	
$7^{\text{th}}$	3	embankment and cutting, borrow pits, making profiles of embankment, construction of embankment		
,		compaction, preparation of subgrade.		
	$4^{\text{th}}$	Sub-grade preparation: methods of checking camber, gradient and alignment as per recommendations of		
		IRC, equipment used for subgrade preparation.		
	$5^{\text{th}}$	Sub-grade preparation: Stabilization of subgrade. Types of stabilization mechanical stabilization, lime		
		stabilization, cement stabilization, fly ash stabilization etc.		
	. ct	e-Lecture/Video Lecture on sub-grade preparation:		
	1 <sup>st</sup>	Introduction to Sub Base Course and Base Course:		
	and	a) Granular base course: (1) Water Bound Macadam (WBM) (11) Wet Mix Macadam (WMM)	 	
	Z	b) Bitumen Courses: (i) Bituminous Macadam (ii) Dense Bituminous Macadam (DBM)		
	3 <sup>rd</sup>	Introduction to Sub Base Course and Base Course:		
	5	c) Methods of construction as per MORT&H		
$8^{th}$		e-Lecture/Video Lecture on Sub Base Course and Base Course		
	4 <sup>th</sup>	Surfacing:		
		a) Types of surfacing: i) Prime coat and tack coat ii) Surface dressing with seal coat		
	41-	iii) Open graded premix carpet iv) Mix seal surfacing		
	$5^{\mathrm{m}}$	Surfacing:		
		a) Types of surfacing: v) Semi dense bituminous concrete vi) Bituminous Concrete/Asphaltic		
		concrete		

		vii) Mastic Asphalt		
		b) Methods of constructions as per MORT&H specifications and quality control.		
		e-Lecture/Video Lecture on Surfacing		
	$1^{st}$	Rigid Pavements:		
		Construction of concrete roads as per IRC specifications: Form work laying, mixing and placing the		
		concrete, compacting and finishing, curing,		
	$2^{nd}$	Rigid Pavements:		
		Construction of concrete roads as per IRC specifications: joints in concrete pavement, equipment used		
9 <sup>th</sup>	nd	e-Lecture/Video Lecture on Rigid Pavements	l	
	3 <sup>rd</sup>	Group discussion / Technical Quiz / Seminar		
	$4^{tn}$	Unit 6: Hill Roads (06 Hrs)		
		Introduction: Typical cross-sections showing all details of a typical hill road, partly in cutting and partly		
	th	in filling		
	5 <sup>th</sup>	Special problems of hill areas:		
	1 St	Landslides: Causes, prevention and control measures, use of geogrids, geoflexiles, geo-synthetics		
	1 <sup>st</sup>	Special problems of hill areas: Drainage, Soil erosion		
	2"	Special problems of hill areas: Snow clearance, snow avalanches, frost, Land Subsidence		
th	- rd	e-Lecture/Video Lecture on Special problems of hill areas		
10 <sup>ui</sup>	3 <sup>rd</sup>	Unit 7: Road Drainage (06 Hrs)		
	, th	e-Lecture/Video Lecture on Road Drainage Works		
	4 <sup>th</sup>	Necessity of road drainage work, cross drainage works		
	5 <sup>m</sup>	Surface and subsurface drains and storm water drains.		
	1 <sup>st</sup>	Location, spacing and typical details of side drains, side ditches for surface drainage.		
	$2^{nd}$	Intercepting drains, pipe drains in hill roads, details of drains in cutting embankment, typical cross		
.1	nd	sections	l	
11 <sup>th</sup>	3 <sup>rd</sup>	Quarries / Assignment -2		
	4 <sup>th</sup>	Sessional Test – 2		
	$5^{\text{th}}$	Unit 8: Road Maintenance (06 Hrs)		
		e-Lecture/Video Lecture on Road Maintenance		
	$1^{st}$	Common types of road failures of flexible pavements: Pot hole, rutting - their causes and remedies (brief		
	nd	description)	l	
	$2^{n\alpha}$	Common types of road failures of flexible pavements: Alligator cracking, upheaval - their causes and		
12 <sup>th</sup>	- rd	remedies (brief description)		
12	3 <sup>10</sup>	Maintenance of bituminous road such as seal-coat, patch-work and recarpeting.	ļ	
	4 <sup>m</sup>	Maintenance of concrete roads-filling cracks, repairing joints, maintenance of shoulders (berms),		
	rth.	maintenance of traffic control devices	<u> </u>	
	5 <sup>m</sup>	Group discussion / Technical Quiz / Seminar	<u> </u>	
$13^{\text{th}}$	1 <sup>st</sup>	Unit 9: Road Construction Equipment (08 Hrs)		
10		e-Lecture/Video Lecture on Road Construction Equipment		

	$2^{nd}$	Output and use of the following plant and equipment: Hot mix plant		
	$3^{rd}$	Output and use of the following plant and equipment: Tipper, tractors (wheel and crawler) scraper,		
	$4^{\text{th}}$	Output and use of the following plant and equipment: Bulldozer, dumpers, shovels,		
	$5^{\text{th}}$	Output and use of the following plant and equipment: Grader, roller, dragline		
	$1^{st}$	Output and use of the following plant and equipment: Asphalt mixer and tar boilers		
	$2^{nd}$	Output and use of the following plant and equipment: Road pavers		
14 <sup>th</sup>	$3^{rd}$	Unit 10: Airport Engineering (10 Hrs)		
14		e-Lecture/Video Lecture on Airport Engineering		
	$4^{\text{th}}$	Necessity of study of airport engineering, aviation transport scenario in India.		
	$5^{\text{th}}$	Factors to be considered while selecting a site for an airport with respect to zoning laws.		
	$1^{st}$	Introduction to Runways,		
	$2^{nd}$	Introduction to Taxiways		
$15^{\text{th}}$	$3^{rd}$	Introduction to Apron		
	$4^{\text{th}}$	Group discussion / Technical Quiz / Seminar		
	$5^{\text{th}}$	Sessional Test - 3		

**Civil Engineering** Name of the Faculty : Discipline Т Р L :  $5^{\text{th}}$ Subject SOIL AND FOUNDATION ENGINEERING Semester 4 : : --

Lesson Plan Duration :

15 Weeks (from Jul-2018 to Dec-2018)

		Theory	Delivery Date	e of Lecture	Whether the
Week	Lecture Day	<b>Topic</b> (including Assignments / Seminar / Group Discussion / Sessional Tests)	Expected	Actual	Lesson Plan Followed? Yes/No
	1 <sup>st</sup>	Introduction to the subject and its necessity e-Lecture/Video Lecture /PPTs on the subject matters			
1 <sup>st</sup>	$2^{nd}$	Unit 1: Introduction (03 Hrs) Importance of soil studies in Civil Engineering, Geological origin of soils with special reference to soil profiles in India: residual and transported soil, alluvial deposits, lake deposits			
	3 <sup>rd</sup>	Dunes and loess, glacial deposits, black cotton soils, conditions in which above deposits are formed and their engineering characteristics.			
	$4^{\text{th}}$	Names of organizations dealing with soil engineering work in India, soil map of India e-Lecture/Video Lecture /PPTs on Geological origin of soils / Quarries			
	1 <sup>st</sup>	<b>Unit 2: Physical Properties of Soils (04 Hrs)</b> Constituents of soil and representation by a phase diagram Definitions of void ratio, porosity, water content, degree of saturation, specific gravity, unit weight, bulk density/bulk unit weight,			
$2^{nd}$	$2^{nd}$	Definitions of dry unit weight, saturated unit weight and submerged unit weight of soil grains and correlation between them			
	3 <sup>rd</sup>	Simple numerical problems with the help of phase diagrams / Quarries			
	4 <sup>th</sup>	Unit 3: Classification and Identification of Soils (04 Hrs) Particle size, shape and their effect on engineering properties of soil, particle size classification of soils, Gradation and its influence on engineering properties,			
	1 <sup>st</sup>	Relative density and its use in describing cohesionless soils, Behaviour of cohesive soils with change in water content, Atterberg's limit - definitions, use and practical significance			
3 <sup>rd</sup>	$2^{nd}$	Field identification tests for soils, 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 <sup>rd</sup>	e-Lecture/Video Lecture /PPTs on Classification and Identification of Soils / Quarries			
	4 <sup>th</sup>	Unit 4: Flow of Water Through Soils (04 Hrs) e-Lecture/Video Lecture /PPTs on Permeability of soils			
4 <sup>th</sup>	1 <sup>st</sup>	Concept of permeability and its importance, Darcy's law, coefficient of permeability, Seepage velocity and factors affecting permeability			
	$2^{nd}$	Comparison of permeability of different soils as per BIS, Measurement of permeability in the laboratory			

	3 <sup>rd</sup>	Numerical problems on permeability / Quarries		
	$4^{\text{th}}$	Group discussion / Technical Quiz / Seminar		
	$1^{st}$	Unit 5: Effective Stress (Concept only) (04 Hrs)		
$5^{\rm th}$		e-Lecture/Video Lecture /PPTs on Effective Stress		
	$2^{nd}$	Stresses in subsoil, Definition and meaning of total stress, effective stress and neutral stress		
	3 <sup>rd</sup>	Principle of effective stress, Importance of effective stress in engineering problems		
	$4^{\text{th}}$	Simple numerical conceptual problems on effective stress / Quarries		
	$1^{st}$	Sessional Test – 1 / Assignment – 1		
	$2^{nd}$	Unit 6: Deformation of Soils (04 Hrs)		
		e-Lecture/Video Lecture /PPTs on deformation of soils		
$6^{\text{th}}$	$3^{\rm rd}$	Meaning, conditions/situations of occurrence with emphasis on practical significance of: Consolidation		
		and settlement, Creep, Plastic Flow, Heaving, Lateral movement forces and thaw of soil		
	$4^{\text{th}}$	Definition and practical significance of compression index, coefficient of consolidation, degree of		
		consolidation.		
	$1^{st}$	Meaning of total settlement, uniform settlement and differential settlement; rate of settlement and their		
		effects		
41-	$2^{nd}$	Settlement due to construction operations and lowering of water table, Tolerable settlement for different		
7 <sup>th</sup>	rd	structures as per BIS		
	3 <sup>10</sup>	Unit 7: Shear Strength Characteristics of Soils (09 Hrs)		
	, th	e-Lecture/Video Lecture /PPTs on Shear Strength Characteristics of Soils		
	4 <sup>th</sup>	Concept and Significance of shear strength		
	1 <sup>31</sup>	Factors contributing to shear strength of cohesive and cohesion less soils, Coulomb's law		
8 <sup>th</sup>	2 <sup>nd</sup>	Factors contributing to shear strength of cohesive and cohesion less soils, Coulomb's law		
Ũ	3 <sup>10</sup>	Examples of shear failure in soils		
	4 <sup>th</sup>	Examples of shear failure in soils		
	1 <sup>st</sup>	Examples of shear failure in soils		
	$2^{nd}$	Unit 8: Compaction (04 Hrs)		
	nd	e-Lecture/Video Lecture /PPTs on Compaction of Soils		
oth	3 <sup>rd</sup>	Definition and necessity of compaction, Laboratory compaction test (Standard proctor test as per BIS)		
9		definition and importance of optimum water content, maximum dry density; moisture dry density		
	th	relationship for typical soils with different compactive efforts		
	4 <sup>un</sup>	Definition and necessity of compaction, Laboratory compaction test (Modified proctor test as per BIS)		
		definition and importance of optimum water content, maximum dry density; moisture dry density		
	1 st	relationship for typical soils with different compactive efforts		
		compaction control; Density control, measurement of field density by core cutter method and sand		
$10^{\text{th}}$	$2^{nd}$	Compaction control: moisture control Proctor's needle and its use thickness control jobs of an		
	4	compaction control, moisture control, ribetor s needle and its use, unexitess control, jobs of an		

	3 <sup>rd</sup>	Unit 9: Soil Exploration (08 Hrs)	
		Purpose and necessity of soil exploration Reconnaissance, methods of soil exploration, Trial pits	
	$4^{\text{th}}$	Borings (auger, wash, rotary, percussion to be briefly dealt)	
	$1^{st}$	Sampling; undisturbed, disturbed and representative samples; selection of type of sample;	
	$2^{nd}$	thin wall and piston samples; area ratio, recovery ratio of samples and their significance, number and	
$11^{\text{th}}$		quantity of samples	
	3 <sup>rd</sup>	Group discussion / Technical Quiz / Seminar	
	$4^{\text{th}}$	Sessional Test – 2 / Assignment – 2	
	$1^{st}$	Resetting, sealing and preservation of samples, Presentation of soil investigation results	
	$2^{nd}$	e-Lecture/Video Lecture /PPTs on Soil Exploration	
12 <sup>th</sup>	$3^{\rm rd}$	Unit 10: Bearing Capacity of soil (10 Hrs)	
12		Concept of bearing capacity, Definition and significance of ultimate bearing capacity, net safe	
	th	bearing capacity and allowable bearing pressure	
	4 <sup>th</sup>	Guidelines of BIS (IS 6403) for estimation of bearing capacity of soil, Factors affecting bearing capacity	 
	1 <sup>st</sup>	Concept of vertical stress distribution in soils due to foundation loads, pressure bulb	 
	$2^{nd}$	Applications of SPT, unconfined compression test and direct shear test in estimation of bearing capacity,	
th		Simple numerical problems on SPT	
13 <sup>un</sup>	$3^{rd}$	Plate load test (no procedure details) and its limitations,	
		e-Lecture/Video Lecture /PPTs on SPT and Plate load test	
	$4^{\text{th}}$	Improvement of bearing capacity by sand drain method, compaction, use of geo-synthetics.	
	-4	Assignment - 3	
	$1^{st}$	Unit 11: Foundation Engineering (10 Hrs)	
		Concept of shallow and deep foundation; types of shallow foundations: isolated, combined, strip,	
14 <sup>th</sup>	and	mat, and their suitability.	
	2"	Factors affecting the depth of shallow foundations, deep foundations, type of piles and their suitability;	
	3 <sup>rd</sup>	Factors affecting the depth of shallow foundations, deep foundations, type of piles and their suitability;	
	4 <sup>th</sup>	Group discussion / Technical Quiz / Seminar	
	1 <sup>st</sup>	Pile classification on the basis of material, pile group and pile cap.	
15 <sup>th</sup>	2 <sup>na</sup>	Pile classification on the basis of material, pile group and pile cap.	
15	3 <sup>rd</sup>	e-Lecture/Video Lecture /PPTs on Foundation Engineering	
	$4^{\text{th}}$	Sessional Test – 3	

Name of the Faculty : Discipline **Civil Engineering** L Т Р :  $5^{\text{th}}$ Subject Semester 3 **ENVIRONMENTAL EDUCATION** : : --

Lesson Plan Duration :

15 Weeks (from Jul-2018 to Dec-2018)

		Theory	Delivery Date	of Lecture	Whether the
Week	Lecture	Торіс	E-marked	A	Lesson Plan Followed?
	Day	(including Assignments / Seminar / Group Discussion / Sessional Tests)	Expected	Actual	Yes/No
	1 <sup>st</sup>	Introduction to the subject and its necessity			
		e-Lecture/Video Lecture /PPTs on the subject matters			
$1^{st}$	$2^{nd}$	<b>Unit – 1 (02 Hrs)</b>			
		Definition and Scope of Environmental Education			
	3 <sup>rd</sup>	Importance of Environmental Education			
	$1^{st}$	Unit – 2 (03 Hrs)			
		Basics of ecology, biodiversity,			
$2^{nd}$	$2^{nd}$	Eco system and sustainable development			
	3 <sup>rd</sup>	Unit – 3 (12 Hrs)			
		e-Lecture/Video Lecture /PPTs on the Sources of pollution			
	$1^{st}$	Sources of pollution - natural and manmade			
$3^{\rm rd}$	$2^{nd}$	causes, effects and control measures of pollution (air) and their units of measurement			
	3 <sup>rd</sup>	causes, effects and control measures of pollution (water) and their units of measurement			
	$1^{st}$	causes, effects and control measures of pollution (noise) and their units of measurement			
$4^{\text{th}}$	$2^{nd}$	causes, effects and control measures of pollution (soil) and their units of measurement			
	3 <sup>rd</sup>	causes, effects and control measures of pollution (radioactive) and their units of measurement			
	$1^{st}$	causes, effects and control measures of pollution (nuclear) and their units of measurement			
5 <sup>th</sup>	$2^{nd}$	Quarries / Assignment -2			
	3 <sup>rd</sup>	Sessional Test -1			
	$1^{st}$	Group discussion / Technical Quiz / Seminar			
6 <sup>th</sup>	$2^{nd}$	Unit – 4 (06 Hrs)			
0		e-Lecture/Video Lecture /PPTs on the SWM			
	3 <sup>rd</sup>	Solid waste management – Causes of urban and industrial waste			
	$1^{st}$	Solid waste management - Effects of urban and industrial waste			
7 <sup>th</sup>	$2^{nd}$	Solid waste management - Control measures of urban and industrial waste			
	3 <sup>rd</sup>	Quarries / Revision			

	$1^{st}$	<b>Unit – 5 (04 Hrs)</b>		
8 <sup>th</sup>		e-Lecture/Video Lecture /PPTs on the Mining and Deforestation		
	$2^{nd}$	Mining - Causes, effects and control measures		
9 <sup>th</sup>	$3^{rd}$	Deforestation - Causes, effects and control measures		
	$1^{st}$	<b>Unit – 6 (10 Hrs)</b>		
		e-Lecture/Video Lecture /PPTs on the Environmental Legislation		
	$2^{nd}$	Environmental Legislation - Water (prevention and control of pollution) Act 1974		
10 <sup>th</sup>	$3^{rd}$	Environmental Legislation - Air (Prevention and Control of Pollution) Act 1981		
	$1^{st}$	Environmental Legislation - Environmental Protection Act 1986,		
	$2^{nd}$	Environmental Legislation - Role and Function of State Pollution Control Board,		
11 <sup>th</sup>	$3^{\rm rd}$	Environmental Legislation - Environmental Impact Assessment (EIA)		
	$1^{st}$	Sessional Test -2		
	$2^{nd}$	Group discussion / Technical Quiz / Seminar		
	$3^{rd}$	<b>Unit – 7 (04 Hrs)</b>		
		e-Lecture/Video Lecture /PPTs on the Environmental Legislation		
	$4^{\text{th}}$	Role of Non-conventional Energy Resources (Solar Energy)		
	$5^{\text{th}}$	Role of Non-conventional Energy Resources (Wind Energy)		
12 <sup>th</sup>	1 <sup>st</sup>	Role of Non-conventional Energy Resources (Bio Energy)		
	$2^{nd}$	Role of Non-conventional Energy Resources (Hydro Energy)		
	$3^{\rm rd}$	Quarries / Revision		
13 <sup>th</sup>	$1^{st}$	<b>Unit – 8 (04 Hrs)</b>		
		e-Lecture/Video Lecture /PPTs on the Current Issues in Environmental Pollution		
	$2^{nd}$	Current Issues in Environmental Pollution - Global Warming		
	$3^{rd}$	Current Issues in Environmental Pollution - Green House Effect		
14 <sup>th</sup>	1 <sup>st</sup>	Current Issues in Environmental Pollution - Depletion of Ozone Layer, Recycling of Material		
	$2^{nd}$	Current Issues in Environmental Pollution - Environmental Ethics, Rain Water Harvesting		
	$3^{rd}$	Current Issues in Environmental Pollution - Maintenance of Groundwater, Acid Rain		
15 <sup>th</sup>	1 <sup>st</sup>	Current Issues in Environmental Pollution – Carbon Credits.		
	$2^{nd}$	Group discussion / Technical Quiz / Seminar		
	$3^{\rm rd}$	Sessional Test -3		