

Civil Engineering Department
Lesson plan

Name of Faculty		Chetna		
Discipline		Civil Engineering		
Semester		5 th		
Subject		Plumbing Services		
Lesson Plan Duration		15 weeks (from Sept 2023 to Dec 2023)		
Work load [Theory + Practical] Per Week		[03+02]		
Week	Day	Theory Topic/ Assignment/ Test	No.	Practical
1 st	1	Plumber's Tools Plumbing, plumber, Selection, use and care of tools required for plumbing work	1	Introduction about Plumbing services
	2	Plumbing tools such as threading die, bit brace, ratchet brace, pipe wrench		
	3	Spanner set, pipe cutter, pipe vice, hacksaw		
2 nd	1	Chisel, files and other common hand tools	2	Carry out simple job requiring cutting mild steel plate, filing, drilling and tapping holes etc.
	2	Bench drilling machine, soldering iron		
	3	Revision & copy check		
3 rd	1	Pipes and Pipe Fitting Pipes and different types of pipes, Selection and use	3	Repeat
	2	GI Pipes, Plastic pipes, PVC pipes		
	3	HDPE pipes, Cast iron pipes		
4 th	1	Plumbing symbols; Bends, Elbows, Sockets, Tees	4	Practice cutting, threading and bending of metal pipes; cutting and shaping of PVC pipes
	2	Unions, Pipe cutting, Pipe bending, Pipe Threading		
	3	Pipe joints		
5 th	1	Pipe fitting	5	Repeat
	2	Alignment of pipes, Branching of pipes		
	3	Safety precautions		
6 th	1	Revision & copy check	6	Carry out simple pipe connections requiring use of bends, tees, elbows etc
	2	Water Supply System Sources of water		
	3	Rainwater harvesting		
7 th	1	Water supply systems in a town	7	Repeat
	2	Water distribution systems		
	3	Distribution reservoirs; Pumps		
8 th	1	Valves & types	8	Erect simple water supply
	2	Fire hydrants; Storage of water in buildings		

	3	Types of tanks		system
9 th	1	Laying water supply pipe lines	9	Repeat
	2	Revision & copy check		
	3	Domestic Drainage Drainage system two pipe, one pipe		
10 th	1	Drainage system single stack and other systems	10	Test drainage lines by using different testing methods
	2	Trap and types ,Cesspool,		
	3	Sceptic tank, Cleaning blocked pipes and drains Laying sanitary and sewer pipes		
11 th	1	Manholes	11	Repeat
	2	Inspection and testing (pressure & leakage test, testing straightness of pipes, ball test etc.)		
	3	Fixing accessories, Problems in drainage and their solution		
12 th	1	Revision & copy check	12	Practice fixing of different valves
	2	Sanitary Appliances Flush toilet, Squat toilet		
	3	Wash basin, Sink		
13 th	1	Floor traps, Urinal	13	Repeat
	2	Bathtub, Shower, Bidet		
	3	Mixing tap, Popup waste		
14 th	1	Revision & copy check	14	Install sanitary fittings like washbasin, Sink, Floor traps, Urinal, Bathtub and heating appliance like geyser
	2	Heating System Heat transfer , mode of heat transfer		
	3	Water heater, Geyser		
15 th	1	Domestic hot water supply system	15	Repeat
	2	Central heating, Solar water heater		
	3	Revision & copy check		

Civil Engineering Department
Lesson plan

Name of Faculty			Gaurav	
Discipline			Civil Engineering	
Semester			5 th	
Subject			Highway Engineering	
Lesson Plan Duration			15 weeks (from Sept 2023 to Dec 2023)	
Work load [Theory + Practical] Per Week			[04+02]	
Week	Day	Theory Topic/ Assignment/ Test	No.	Practical
1 st	1	Introduction Importance of Highway engineering	1	Determination of penetration value of bitumen
	2	Functions of IRC, CRRI, MoRT&H, NHAI		
	3	Classification of roads		
	4	Road Geometrics Glossary of terms used in road geometrics and their importance: Right- of-way, formation width, road margin, road shoulder,		
2 nd	1	carriage way, side slopes,	2	Determination of softening point of bitumen
	2	kerbs, formation levels, camber and gradient		
	3	Average running speed, stopping and overtaking sight distance		
	4	Necessity of curves, horizontal and vertical curves including transition curves.		
3 rd	1	Super elevation and methods of providing super elevation	3	Determination of ductility of bitumen
	2	Sketch of typical cross-sections in cutting and filling on straight alignment and at a curve		
	3	Highway Alignment Basic considerations governing alignment for a road in plain and hilly area		
	4	Highway location, marking of alignment on ground, setting out alignment of road, setting out bench marks, control pegs for embankment and		

		cutting		
4th	1	Road Materials Different types of road materials in use; soil, aggregate, binders	4	Determination of impact value of the road aggregate
	2	Introduction to California Bearing Ratio, method of finding CBR value and its significance. Aggregate: Source and types, important properties, strength, durability		
	3	Binders: Common binders; bitumen, properties as per BIS specifications,		
	4	penetration, Assignment		
5th	1	softening point, procedures and significance,	5	Determination of abrasion value (Los Angeles') of road aggregate
	2	ductility and viscosity test of bitumen		
	3	cut back and emulsion and their uses, Bitumen modifiers		
	4	Revision		
6th	1	Road pavements Flexible and rigid pavement, their merits and demerits, typical cross-sections, functions of various components	6	Determination of crushing strength of aggregate
	2	Sub-grade preparation: Borrow pits, making profiles of embankment, construction of embankment,		
	3	compaction, preparation of subgrade, methods of checking camber,		
	4	gradient and alignment as per recommendations of IRC, equipment used for subgrade preparation.		
7th	1	Stabilization of subgrade: Types of stabilization mechanical stabilization	7	Determination of flakiness and elongation index of aggregate
	2	lime stabilization, cement stabilization,		
	3	fly ash stabilization etc.(introduction only)		
	4	Base Course: a) Granular base course:		
8th	1	(i) Water Bound Macadam (WBM)	8	-Do-
	2	ii) Wet Mix Macadam (WMM)		
	3	Bitumen Courses: (a) Bituminous Macadam (b) Dense Bituminous Macadam (DBM) c) *Methods of construction as per MORT&H		
	4	Surfacing: * Types of surfacing a) Prime coat and tack coat b) Surface dressing with seal coat		

9 th	1	c) Open graded premix carpet d) Mix seal surfacing e) Semi dense bituminous concrete f) Bituminous Concrete	9	Determination of the California bearing ratio (CBR) for the sub-grade soil
	2	* Methods of constructions as per MORT&H specifications and quality control; equipments used for above.		
	3	Rigid Pavements: Construction of concrete roads as per IRC specifications: Form work laying, mixing and placing the concrete, compacting and finishing, curing,		
	4	joints in concrete pavement, equipment used. Roller compacted concrete Assignment		
10 th	1	Hill Roads Introduction: Typical cross-sections showing all details of a typical hill road, partly in cutting and partly in filling	10	Demonstration of working of hot mix plant through a field visit
	2	Special problems of hill areas a) Landslides: Causes, prevention and control measures, use of geogrids, geoflexbiles, geo synthetics b) Drainage c) Soil erosion d) Snow: Snow clearance, snow avalanches, frost e) Land Subsidence		
	3	Road Drainage Necessity of road drainage work, cross drainage works		
	4	Surface and subsurface drains and storm water drains. Location, 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 Revision		
11 th	1	Road Maintenance Common types of road failures of flexible pavements: Pot hole, cracks, rutting, alligator,	11	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
	2	cracking, upheaval - their causes and remedies (brief description)		
	3	Maintenance of bituminous road such as crack sealing,		
	4	patch-work and resurfacing.		
12 th	1	Maintenance of concrete roads-filling cracks,		
	2	repairing joints, maintenance of shoulders (berms)		
	3	Road Construction Equipment Output and use of the following plant and equipment A] Hot mix plant		

	4	B] Tipper, tractors (wheel and crawler) scraper,	12	-DO-
13 th	1	bulldozer, dumpers, shovels, grader, roller, dragline	13	-DO-
	2	C] Asphalt mixer		
	3	and tar boilers		
	4	D] Road pavers		
14 th	1	E] Paver finisher	14	-DO-
	2	Airport Engineering Necessity of study of airport engineering,		
	3	aviation transport scenario in India		
	4	Factors to be considered while selecting a site for an airport with respect to zoning laws. Assignment		
15 th	1	Introduction to Runways,	15	Demonstration of working of mixing and spraying equipment through a field visit
	2	Taxiways,		
	3	Apron and		
	4	Hanger Revision		

Lesson Plan

Name of the faculty : Reema
 Discipline : Civil Engineering
 Semester : 5th
 Subject : Reinforced Cement Concrete Design
 Lesson Plan Duration : 15 weeks (from Sept 2023 to Dec 2023)
 Work Load (Lecture/Practical) per week (in hours): Lectures-05

Week	Lecture Day	Theory Topic (Including assignment/test)
1 st	1 st	Introduction a) Concept of Reinforced Cement Concrete (RCC) b) Reinforcement Materials: Suitability of steel as reinforcing material
	2 nd	Properties of mild steel and HYSD steel c) Loading on structures as per IS: 875
	3 rd	Introduction to following methods of RCC design a) Working stress method: Definition and basic assumptions
	4 th	b) Limit state method: Definition and basic assumptions
	5 th	Shear and Development Length Shear as per IS:456-2000 by working stress method a) Shear strength of concrete without shear reinforcement
	6 th	b) Maximum shear stress
2 nd	7 th	c) Shear reinforcement
	8 th	Concept of Limit State Method
	9 th	a) Definitions and assumptions made in limit state of collapse (flexure)
	10 th	b) Partial factor of safety for materials
3 rd	11 th	c) Partial factor of safety for loads
	12 th	d) Design loads
	13 th	e) Stress block, parameters
	14 th	Singly Reinforced beam a) Theory of singly reinforced beam by Limit State Method
	15 th	Design of singly reinforced beam by Limit State Method
4 th	16 th	Numerical Problems
	17 th	Numerical Problems
	18 th	Numerical Problems
	19 th	Doubly Reinforced Beams Theory of simply supported doubly reinforced rectangular beam by Limit State Method
	20 th	Design of simply supported doubly reinforced rectangular beam by Limit State Method
	21 st	Numerical Problems

5 th	22 nd	Numerical Problems
	23 rd	Numerical Problems
	24 th	Class Test
	25 th	Theory and design of simply supported doubly reinforced rectangular beam by Limit State Method
6 th	26 th	Assignment
	27 th	1 st Sessional Test
	28 th	Revision of Unit -1,Unit -2,Unit -3
	29 th	isolated T beam
	30 th	'L' beams
7 th	31 st	One Way Slab Theory of simply supported one way slab including sketches showing reinforcement details (plan and section) by Limit State Method.
	32 nd	Design of simply supported one way slab including sketches showing reinforcement details (plan and section) by Limit State Method.
	33 rd	Numerical Problems
	34 th	Numerical Problems
	35 th	Numerical Problems
8 th	36 th	Revision of Unit -4,Unit -5,Unit -6
	37 th	Two Way Slab Theory of two-way simply supported slab with corners free to lift
	38 th	Design of two-way simply supported slab with corners free to lift
	39 th	Numerical Problems
	40 th	Numerical Problems
9 th	41 st	Revision of Unit -7
	42 nd	Revision of Unit -8
	43 rd	Class Test
	44 th	Axially Loaded Column a) Definition and classification of columns
	45 th	b) Effective length of column
10 th	46 th	c) Specifications for longitudinal reinforcement
	47 th	Specifications for lateral reinforcement
	48 th	Design of axially loaded square Limit State Method including sketching of reinforcement(sectional elevation and plan)
	49 th	Design of axially loaded rectangular by Limit State Method including sketching of reinforcement(sectional elevation and plan)
	50 th	Design of axially loaded circular short columns by Limit State Method including sketching of reinforcement(sectional elevation and plan)
11 th	51 st	Numerical Problems
	52 nd	2 nd Sessional Test
	53 rd	Numerical Problems
	54 th	Numerical Problems

	55 th	Numerical Problems
12 th	56 th	Class Test
	57 th	Revision of Unit -9
	58 th	Revision of Unit -10
	59 th	Assignment
	60 th	Pre-stressed Concrete a) Concept of pre-stressed concrete
13 th	61 st	b) Methods of pre-stressing : pre-tensioning
	62 nd	c) Methods of pre-stressing : post-tensioning
	63 rd	Revision
	64 th	Advantages of pre-stressing
	65 th	Disadvantages of pre-stressing
14 th	66 th	Losses in pre-stress
	67 th	Revision
	68 th	3 rd Sessional Test
	69 th	Revision
	70 th	Numerical Problems
15 th	71 st	Doubt from Unit -1,Unit -2
	72 nd	Doubt from Unit -3,Unit -4
	73 rd	Doubt from Unit -5,Unit -6
	74 th	Doubt from Unit -7,Unit -8
	75 th	Doubt from Unit -9,Unit -10,Unit -11

Lesson

Plan Name of the Faculty : Chetna
Discipline : Civil
Engineering
Semester : 5th
Subject : R.C.C Drawing
Lesson Plan Duration : 15 weeks (from Sept 2023 to Dec 2023)
Work Load (Lecture/ Practical) Per Week (In Hours): Practical's -03

Week	Day	RCC Drawing Topic
1 st	1 st	RC Drawing: Reinforcement details from the given data for the following structural elements with bar bending schedules Drawing No. 1: RC Slabs - One way slab
2 nd	2 nd	Two way slab
3 rd	3 rd	Cantilever Slab
4 th	4 th	Drawing No.2 : Beams-Singly reinforced rectangular beams with vertical stirrups
5 th	5 th	Doubly reinforced rectangular beams with vertical stirrups
6 th	6 th	Cantilever beam with vertical stirrups
7 th	7 th	Drawing No.3: Columns and Footings – Square Columns with lateral ties and their isolated sloped column footings.
8 th	8 th	Rectangular Columns with lateral ties and their isolated sloped column footings.
9 th	9 th	Circular Columns with lateral ties and their isolated sloped column footings.
10 th	10 th	Drawing No. 4: Portal Frame – Three bay two storey RC portal frame with blow up of column beam junctions.
11 th	11 thDo.....
12 th	12 th	Drawing No. 5 : Draw at least one sheet using AutoCAD software
13 th	13 thDo.....
14 th	14 thDo.....
15 th	15 thDo.....

Lesson Plan

Name of the Faculty : Chetna/Reema
 Discipline : Civil Engineering
 Semester : 5th
 Subject : Computer Applications in Civil
 Engineering Lesson Plan Duration : 15 weeks (from Sept 2023 to Dec 2023)
 Work Load (Lecture/ Practical) Per Week (In Hours): Practical's -06

Week	Day	CACE Topic
1 st	1 st	Introduction and use of AutoCAD for making 2D Drawings
	2 nd	-do-
2 nd	3 rd	Develop plan
	4 th	-do-
3 rd	5 th	-do-
	6 th	-do-
4 th	7 th	Section and elevation of a residential building
	8 th	-do-
5 th	9 th	-do-
	10 th	-do-
6 th	11 th	Class test
	12 th	Demonstration of Civil Engineering software like STAAD-Pro
7 th	13 th	-do-
	14 th	-do-
8 th	15 th	-do-
	16 th	-do-
9 th	17 th	Demonstration of Civil Engineering software like Revit or Primavera Project Plane
	18 th	-do-
10 th	19 th	-do-
	20 th	-do-
11 th	21 st	-do-
	22 nd	Class test
12 th	23 rd	Demonstration of Civil Engineering softwares like Auto CIVIL & Mx Road
	24 th	-do-
13 th	25 th	-do-
	26 th	Demonstration of Civil Engineering softwares like Build Superfast, BIM, ArcGIS
14 th	27 th	-do-
	28 th	-do-
15 th	29 th	-do-
	30 th	Class test

Lesson Plan

Name of Faculty	Suresh Kumar
Discipline	Civil Engineering
Semester	5 th
Subject	Repair and Maintenance of Buildings
Lesson Plan Duration	15 Weeks (From Sept 2023 to Dec 2023)
Work load [Theory]	03

Week	Theory	
	Lecture Day	Topic (Including assignment/test)
1st	1	Importance and significance of repair and maintenance of buildings
	2	meaning of maintenance
	3	Objectives of maintenance
2nd	4	Factors influencing repair and maintenance
	5	Definition of deterioration
	6	Factors causing deterioration
3rd	7	Factors causing deterioration with classification
	8	Human factors causing deterioration
	9	Chemical factors causing deterioration
4th	10	Environmental conditions causing deterioration
	11	Miscellaneous factors

	12	Effects of various agencies of deterioration on various buildings materials bricks, timber, concrete, paints, metals, plastics
5th	13	Revision
	14	Test
	15	Systematic approach of investigation
6th	16	Procedure of investigation
	17	Sequence of detailed steps for diagnosis of building defects
	18	List non-destructive and others tests on structural elements and materials to evaluate the conditions of the buildings and study of three most commonly used tests
7th	19	Define defects in building
	20	classification of defects
	21	Main causes of building defects in various buildings elements foundations basements, and DPC
8th	22	Main causes of building defects in various buildings elements Walls, columns and beams and roof and terraces
	23	Main causes of building defects in various buildings elements joinery decorative and protective finishes , services , defects caused by dampness
	24	Compatibility aspects of repair maintenance
9th	25	State application of Anti corrosion coatings , bonding aids
	26	Application of repair mortars, curing compounds, joint sealants
	27	Water proofing system for roofs, Protective Coatings
10th	28	Revision
	29	Test

	30	Preventive maintenance considerations
11th	31	Surface preparation techniques for repair
	32	Crack repair methods, Epoxy injection
	33	Grooving and sealing , Stitching Adding reinforcement and Grouting
12th	34	Flexible sealing by sealant
	35	Repair of surface defects of concrete bug holes, form tie holes, honey comb and larger voids
	36	Repair of Corrosion in RCC elements
13th	37	Material placement techniques with sketches
	38	Repair of DPC against Rising Dampness with physical and electrical methods
	39	Repair of DPC against Rising Dampness with Chemical methods
14th	40	Repair of walls
	41	Waterproofing of wet areas and roofs
	42	Repair of joints in buildings types of sealing joints
15th	43	Techniques for repair of joints and repair of overhead overhead and underground watertanks
	44	Revision
	45	Test

Lesson plan

Name of Faculty	Sahil Bangar
Discipline	Civil Engineering
Semester	5 th semester
Subject	Railways, Bridges and Tunnels
Lesson Plan Duration	15 weeks (from Sept 2023 - Dec 2023)
Work load [Theory + Practical] Per Week	[05 + 00]

Week	Day	Theory Topic/ Assignment/ Test
1 st	1	1. Introduction to Indian Railways
	2	2. Railway surveys: Factors influencing the railways' route
	3	Brief description of various types of railway survey
	4	3. Classification of permanent way describing its component parts
	5	3. Classification of permanent way describing its component parts
2 nd	1	4. Rail Gauge: Definition
	2	Types, and practice in India
	3	5. Rails – types of rails
	4	6. Rail Fastenings: Rail joints
	5	Types of rail joints
3 rd	1	Fastenings for rails
	2	Fish plates
	3	Bearing plates
	4	7. Sleepers: Functions of sleepers
	5	Types of sleepers, requirements of an ideal material for sleepers.
4 th	1	Requirements of an ideal material for sleepers.
	2	8. Ballast: Function of ballast, requirements of an ideal material for ballast
	3	8. Ballast: Function of ballast, requirements of an ideal material for ballast
	4	9. Crossings and signalling: Brief description regarding different types of crossings/signalling
	5	9. Crossings and signalling: Brief description regarding different types of crossings/signalling
5 th	1	9. Crossings and signalling: Brief description regarding different types of crossings/signalling
	2	9. Crossings and signalling: Brief description regarding different types of crossings/signalling

	3	10. Maintenance of track: Necessity.
	4	Maintenance of track, inspection of soil
	5	Inspections of Track and fixtures
6 th	1	Maintenance and boxing of ballast maintenance gauges, tools
	2	11. Earthwork and drainage: Features of the railroad, bed level, the width of formation, side slopes, drains
	3	Methods of construction
	4	Requirement of drainage system
	5	12. Station and yards: purpose and types of stations and yards
7 th	1	12. Station and yards: purpose and types of stations and yards
	2	Revision and Class Test
	3	Discussion and self assessment of the class test
	4	Field Visit to Railway Track
	5	Report of Field Visit- Railway Track
8 th	1	13. Introduction Bridge – its function and component parts
	2	Difference between a bridge and a culvert
	3	14. Classification of Bridges -- Their structural elements and suitability: 14.1 According to life-permanent and temporary
	4	14.2 According to deck level – Deck, through and semi-through 14.3 According to material –timber, masonry, steel, RCC, pre-stressed
	5	14.4 According to structural form; - Grade Separators-Railway Road Over Bridges (ROB), Road Under Bridge(RUB)
9 th	1	- Beam type –RCC, T-Beam, steel girder bridges, plate girder and box girder, balanced cantilever, Trussed bridges.
	2	- Arch type – open spandrel and filled spandrel barrel and rib type
	3	- Suspension type – unstiffened and stiffened and table (its description with sketches)
	4	- According to the position of highest flood level submersible and nonsubmersible
	5	14.5 IRC classification
10 th	1	14.6 Concept of Railway ROB and RUB – Precast components of ROB, drainage problems and solutions of RUB
	2	14.6 Concept of Railway ROB and RUB – Precast components of ROB, drainage problems and solutions of RUB
	3	15. Bridge Foundations: Introduction to open foundation, pile foundation, well foundation
	4	15. Bridge Foundations: Introduction to open foundation, pile foundation, well foundation
	5	16. Piers, Abutments and Wingwalls 16.1 Piers-definition, parts; types –solid (masonry and RCC), open
11 th	1	16.2 Abutments and wing walls – definition

	2	Types of abutments (straight and tee)
	3	Abutment with wing walls (straight, splayed, return and curved)
	4	17. Bridge bearings Purpose of bearings; types of bearings – fixed plate, rocker and roller, Elastomeric bearings.
	5	17. Bridge bearings Purpose of bearings; types of bearings – fixed plate, rocker and roller, Elastomeric bearings.
12 th	1	18. Maintenance of Bridges 18.1 Inspection of bridges 18.2 Routine maintenance
	2	Revision and Class Test
	3	Discussion and self assessment of the class test
	4	Field Visit to Bridge Construction Site
	5	Report of Field Visit- Bridge Construction Site.
13 th	1	19. Definition and necessity of tunnels
	2	20. Typical section of tunnels for a national highway and single and double broadgauge railway track
	3	20. Typical section of tunnels for a national highway and single and double broadgauge railway track
	4	21. Ventilation –necessity and methods of ventilation, by blowing, exhaust and combination of blowing and exhaust
	5	21. Ventilation –necessity and methods of ventilation, by blowing, exhaust and combination of blowing and exhaust
14 th	1	21. Ventilation –necessity and methods of ventilation, by blowing, exhaust and combination of blowing and exhaust
	2	22. Drainage method of draining water in tunnels
	3	23. Lighting of tunnels
	4	Revision and Class Test
	5	Discussion and self assessment of the class test
15 th	1	Field Visit to Railway Track
	2	Report of Field Visit- Railway Track
	3	Revision
	4	Revision
	5	Revision