Lesson plan

Name of the Faculty		**SAVROOP KAUR**	**Semester**	**5th**
			Lecture per week	**3**
Discipline		**Civil Engineering**		
Subject		**HIGHWAY ENGINEERING**	**Delivery Date of Lecture**	**Remarks**
Lesson plan Duration		**20AUG2024 - 29 NOV2024 (15 weeks)**		
Week	**Lecture Day**	**Topic (including assignment / test)**		
1st	1	UNIT-I 1.1 Introduction 1.1.1 Importance of Highway engineering 1.1.2 Functions of IRC, CRRI, MoRT&H, NHAI		
	2	1.1.3 IRC Classification of roads 1.2 Elements of Road Geometrics 1.2.1 Glossary of terms used in road geo-metrics and their importance: Right- of-way, Formation width, road margin, road shoulder, carriage way, side slopes, kerbs, formation levels		
	3	1.2.2 Concept of camber and gradients- their types and functions 1.2.3 Concept of Design speed, average running speed, stopping and overtaking sight distance.		
2nd	1	1.2.4 Curves- Necessity and types (horizontal and vertical curves including transition curves)		
	2	1.2.5 Super elevation-Definition, methods of providing super elevation and concept of widening of roads on curves		
	3	1.2.6 Sketch of typical cross-sections in cutting and filling on straight alignment and at a curve (Note: No design/numerical problem to be taken)		
3rd	1	UNIT-II 2.1 Highway Surveys, Alignment and Plan 2.1.1 Topographic Map-Concept and uses		
	2	2.1.2 Road surveys for highway location-Stages of road surveys (map study, reconnaissance, preliminary surveys, final location and detailed surveys)		
	3	2.1.3 Highway alignment-Definition and requirements		
4th	1	2.1.4 Standards for preparing highway plans- Stages and objectives. 2.1.5 Basic considerations governing alignment for a road in plain and hilly area		
	2	2.1.6 Setting out alignment of road- Highway location, bench marks and control pegs for embankment and cutting.		
	3	2.2 Highway Materials 2.2.1 Different types of road materials – (Soil, Aggregates and Binders) their common types, functions & requirements.		

5th	1	2.2.2 Introduction to California Bearing Ratio, method of finding CBR value and its significance.		
	2	2.3.3 Bitumen and Tar their properties as per BIS specifications, penetration, softening point, ductility and viscosity test of bitumen, procedures and significance.		
	3	2.3.4 Cut back, emulsion and Bitumen modifiers (CRMB, PMB) their functions.		
6th	Sessional 1			
7th	1	UNIT-III 3.1 Highway Pavements Construction 3.1.1 Highway pavement: Flexible and rigid pavement, their merits and demerits, typicalcross- sections, functions of various components		
	2	3.1.2 Sub-grade preparation: - Borrow pits, making profiles of embankment, construction of embankment, compaction, preparation of subgrade, and methods of checking camber, gradient and alignment as per recommendations of IRC, equipment used for subgrade preparation.		
	3	3.1.3 Stabilization of subgrade. Types of stabilization mechanical stabilization, lime stabilization, cement stabilization; fly ash stabilization etc. (introduction only)		
8th	1	3.1.4 Stabilization of sub base & base course: Granular base course: a) Water Bound Macadam (WBM) b) Wet Mix Macadam (WMM) c) Bitumen Courses: (i) Bituminous Macadam (ii) Dense Bituminous Macadam (DBM) *Methods of construction as per MoRT&H		
	2	3.1.5 Surfacing: Definition and types of surfacing a) Prime coat and tack coat b) Surface dressing with seal coat c) Open graded premix carpet d) Seal coat		
	3	e) Bituminous Concrete f) Bituminous penetration macadam. * Methods of constructions as per MORT&H specifications and quality control;equipments used for above.		
9th	1	3.1.6 Rigid Pavements:- Construction of concrete roads as per IRC specifications: Form work laying, mixing and placing the concrete, compacting and finishing, curing, joints inconcrete pavement, equipment used. Roller compacted concrete.		
	2			
	3			
10th	Sessional 2			

11 th	1	UNIT-IV 4.1 Hill Roads: 4.1.1 Introduction: Typical cross-sections showing all details of a typical hill road, partly in cutting and partly in filling 4.2 Special problems of hill areas 4.2.1 Landslides: Causes, prevention and control measures, use of geo-grids, geo-flexbiles, geo-synthetics 4.2.2 Drainage 4.2.3 Soil erosion		
	2	4.2.4 Snow: Snow clearance, snow avalanches, frost		
	3	4.2.5 Land Subsidence		
12th	1	4.3 Highway Drainage: 4.3.1 Necessity of road drainage work, cross drainage works 4.3.2 Surface and subsurface drains and storm water drains: - Location, spacing and typical details of side drains, side ditches for surface drainage. 4.3.3 Intercepting drains, pipe drains in hill roads, details of drains in cutting embankment, typical cross sections.		
	2			
	3			
13th	1	UNIT-V		
	2	5.1 Highway Maintenance:		
	3	5.1.1 Common types of road failures of flexible pavements: Pot hole, cracks, rutting, alligator, cracking, upheaval - their causes and remedies (brief description) 5.1.2 Maintenance of bituminous road such as crack sealing, patch-work andresurfacing. 5.1.3 Maintenance of concrete roads-filling cracks, repairing joints, maintenance of shoulders (berms)		
14th	1	5.2 Highway Safety: 5.2.1 Best practices in engineering design for road safety: Geometry of the road, Segregation of local traffic, Pedestrian facility, Bus bays, Illuminations, Development of junction, Signage and road safety audit.		
	2	5.2.3 Essential road construction safety tips: Wear the proper safety equipment, Control traffic, Avoid blind spots, Be Constantly Aware of Surroundings		
	3	5.3 Airport Engineering:- 5.3.1 Concept of Airport engineering.		
15th	1	5.3.2 Factors to be considered while selecting a site for an airport with respect to zoning laws.		
	2	5.3.3 Introduction to Runways, Taxiways, Apron and Hanger. 5.3.4 Types of pavement used in airport runway.		
	3	**Sessional 3**		

Lesson Plan			
Name of the Faculty :	**KIMATI LAL**	**Discipline :**	**Civil Engineering**
Subject	**HIGHWAY ENGINEERING(P)**	**Semester :**	**5TH**
Lesson Plan Duration :	**20-08-2024 TO 30-12-2024**		
		L T	**P**
		- -	**4**
Week		**Delivery Date of Lecture**	**Whether the Lesson Plan Followed? Yes/ No**
	Topic		
	(Including Assignments / Seminar / Group Discussion / Sessional Tests)		
Ist	Determination of penetration value of bitumen		
2nd	Determination of softening point of bitumen		
3rd	Determination of ductility of bitumen		
4th	Determination of impact value of the road aggregate		
5th	aggregate		
6th	**Sessional Test-1**		
7th	Determination of crushing strength of aggregate		
8th	Determination of crushing strength of aggregate		
9th	Determination of flakiness and elongation index of aggregate		
10th	Determination of the California bearing ratio (CBR) for the sub-grade soil		
11th	Determination of the California bearing ratio (CBR) for the sub-grade soil		
12th	**Sessional Test -2**		
13th	Demonstration of working of hot mix plant through a field visit		
14th	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		
15th	Demonstration of working of mixing and spraying equipment through a field visit		
	Sessional Test -3		
16th	Revision of syllabus, display/Intimation of 3rd Sessional marks, Academic evaluation-analysis of Sessionals.		

Lesson plan

Name of the Faculty		**SAVROOP KAUR**	**Semester**	**5th**
			Lecture per week	**2**
Discipline		**Civil Engineering**		
Subject		**CONSTRUCTION MANAGEMENT AND ACCOUNTS**	**Delivery Date of Lecture**	**Remarks**
Lesson plan Duration		**20AUG2024 - 29 NOV2024 (15 weeks)**		
Week	**Lecture Day**	**Topic (including assignment / test)**		
1st		**Unit-1-Introduction:**		
	1st	1.Introduction 1.1Concept of construction management 1.2Main objectives of construction management and overview of the subject		
	2nd	1.3Functions of construction management, planning, organising, staffing, directing, controlling and coordinating, meaning of each of these with respect to construction job.		
2nd	1st	1.4Classification of construction into light, heavy and industrial construction 1.5Stages in construction from conception to completion 1.6The construction team: owner, engineer, architect and contractors, their functions and inter-relationship		
		Unit-2 - Construction Planning		
	2nd	2.1Importance of construction planning 2.2Stages of construction planning- Pretender stage and Contract stage		
3rd	1st	2.3Scheduling construction works by bar charts		
	2nd	2.3.1Definition of activity, identification of activities 2.3.2Preparation of bar charts for simple construction work 2.3.3Preparation of schedules for labour, materials, machinery and finances forsmall works		
4th	1st	2.3.4Limitations of bar charts		
	2nd	2.2Scheduling by network techniques 2.2.1Introduction to network techniques; PERT and CPM, 2.2.2Differencesbetween PERT and CPM terminology		
		1st Sessional Test		
6th		**Unit-3-Organization**		
	1st	3.1Types of organizations: Line, line and staff, functional and their characteristics 3.2Site Organization: 3.2.1Principle of storing and stacking materials at site 3.2.2Location of equipment		
	2nd	3.2.3Preparation of actual job layout for a building 3.2.4Organizing labour at site		

	1st	3.2Construction Labour 3.2.1Conditions of construction workers in India, wages paid to workers		
	2nd	3.2.4Organizing labour at site 3.2Construction Labour		
8th	1st	3.2.1Conditions of construction workers in India, wages paid to workers		
	2nd	3.2.2Important provisions of the following Acts: a)Labour Welfare Fund Act 1936 (as amended) b)Payment of Wages Act 1936 (as amended)		
9th	1st	c)Minimum Wages Act 1948 (as amended) d)Acts relating to Labour Safety		
	Unit-4-Control of Progress:			
	2nd	Analysis of progress and methods of recording progress 4.1Taking corrective actions keeping head office informed 4.2Cost time optimization for simple jobs - Direct and indirect cost, variation with time, cost optimization		
10th	1st	4.3Inspection and Quality Control: -Need, Principles and Stages of inspection and quality control for- Earth, Masonry, RCC work and Sanitary and water supply services		
	2nd	4.4Accidents and Safety in Construction: Concept, causes and remedies		
11 th	1st	4.4.1Safety measures for: - Excavation work, drilling and blasting, hot bituminous works Scaffolding, ladders, form work and demolitions.		
	2nd	4.4.2Safety campaign and safety devices, safety training		
	2nd Sessional Test			
12th	**Unit-5-ACCOUNTS:**			
	1st	5.1 Public Work Accounts: Introduction of various technical terms used in public work accounts:-Technical sanction, allotment of funds, re-appropriation of funds bill,contractor ledger, measurement book running and final account bills complete, preparation of bill of quantities (BOQ),		
	2nd			
13th	1st	completion certificate & report, hand receipt, Aquittance roll. Muster Roll labour, casual labour roll-duties and responsibility of different cadres, budget-stores, returns, account of stock, misc.		
	2nd			
14th	1st	P.W. advances T & P – verification, survey report, road metal material charged direct to works, account - expenditure & revenue head, remittance and deposit head, definition of cash,		
	2nd	precaution in custody of cash book, imprest account, temporary advance, treasury challan,		
15th	1st	preparation of final bills, earnest money, performance security, Students must learn to prepare accounts register.		
	2nd			
	3rd Sessional Test			

Lesson Plan

Name of the Faculty :
Discipline : Civil Enggineering
Subject : RAILWAYS, BRIDGES AND TUNNELS
Lesson Plan Duration : 14 Working day (from Aug 2024 to Dec 2024)
Semester : 5th (Lectrue three per week)

Week	Theory		Delivery Date of Lecture
	Lecture Day	Topic (including Assignments / Seminar / Group Discussion / Sessional Tests)	
1	1st	1.1 Introduction to Indian Railways	
	2nd	1.2 Advantages of Railways: Political, Social, Economic and Techno-Economic Advantages.	
	3rd	1.3 Classification of Indian Railways: On the basis of the Importance of Route, Traffic Carried and Maximum Permissible Speed on the routes.	
2	1st	1.4 Railway surveys: Traffic surveys, Reconnaissance survey, Preliminary Survey and Detailed Survey. 1.5 Permanent Way: Requirement of an ideal permanent way, Capacity of railway track, Gauges in railway track – Broad, Meter and Narrow Gauges, Selection and Uniformity of gauges, Conning of wheels.	
	2nd	1.6 Subgrade and Embankment for Railway Tracks: Functions of subgrade, Subgrade materials and its improvement - use of geo-synthetics, Slopes of embankment their protection, Stability of embankment – Control of erosion, Toe Wall 1.7 Track Alignment: Basic requirements of good alignment, Factors influencing the track alignment.	
	3rd	1.8 Geometric Design of the Railway Track: Necessity of geometric design of a railway track, Gradient and Grade compensation, Speed of the train, Degree of curve, Super-elevation and Negative super-elevation. (Simple Numerical Problems)	
3	1st	2.1 Construction of Track: Earth work - formation and consolidation, Plate laying – laying of a railway track, laying of ballast on the track.	
	2nd	2.2 Track Drainage: Sources of moisture in a railway track, Drainage systems – Surface drainage and subsurface drainage.	
	3rd	2.3 Maintenance of Track: Necessity of maintenance, Daily and Periodic maintenance, Maintenance of track alignment, Maintenance of gauge, Maintenance of proper drainage, maintenance of sleepers.	
4	1st	2.4 Rails: Functions of rails, Requirements of rails, Types of rails – Double Headed Rails, Bull Headed Rails, Flat Footed Rails, Selection of rails, Length of rails.	
	2nd	2.5 Ballast: Functions of ballast, Requirement of the good ballast, Types of ballast, Size and section of ballast, Quantity of ballast.	
	3rd	2.6 Sleepers: Functions of sleepers, Requirements of sleepers, Reinforced and Prestressed Concrete Sleepers.	
5	1st	2.7 Stations and Platforms: Site selection for railway station, Requirement of a railway station, Platforms – Passenger and Goods platforms.	
	2nd	**Revision/Assignment-1**	
	3rd	**Sessional Test -1**	
6	1st	3.1 Bridges: Definition and Basic forms, Components of a bridge, Difference between a bridge and a culvert, Classifications of bridges (only names), Importance of bridges, Standard specifications.	
	2nd	3.2 Investigation for Bridges: Need of investigation, Selection of bridge site, Linear waterway, Economical Span, Location of Piers and Abutments, Vertical clearance above highest flood level, Scour Depth. Factors influencing the choice of the bridge type and its basic features.	
	3rd	3.3 Bridge Foundations: Well foundations – Components and Sinking of wells, Pneumatic Caissons, Cofferdams for bridge piers, Box Caissons.	
7	1st	3.4 Bridge Substructure: Pier and Abutment Caps, Materials for Piers and Abutments, Pier – Loads and Forces to be considered in the design of piers, Abutments - Loads and Forces to be considered in the design of abutments, Back-fill behind the abutments, Wing walls – Straight, Splayed, Return and Curved wing walls.	
	2nd	4.1 Reinforced Concrete Bridges:	
	3rd	4.1.1 Slab bridges – Components of a slab bridge, Number and spacing of main girders, Cross beams.	
8	1st	4.1.2 Introduction only for the: Balanced Cantilever Bridges, Continuous Girder Bridges, Rigid Frame Bridges.	
	2nd	4.2 Prestressed Concrete Bridges: Types of prestressed concrete bridges, Erection of precast girders, Segmental cantilever construction, Cast-in-place segments, Precast segments, Connection at mid-span, Advantages.	
	3rd	4.3 Construction of Bridges: Incremental Push Launching Method	
9	1st	4.4 Bridge Bearings: Purpose of bearings, Types of Bearing – Sliding Plate Bearing, Sliding cum-Rocker Bearing, Steel Roller-cum-Rocker Bearing, Elastomeric Bearing.	
	2nd	4.5 Maintenance of Bridges: Inspection of bridges, Maintenance – Routine, Preventive, Repairs and Strengthening / Replacement Maintenances, Maintenance of Bearings.	
	3rd	**Revision/Assignment-2**	
10	1st	**Sessional Test -2**	
11	1st	5.1 Necessity, Advantages and Classifications of tunnels, Size and shape of tunnel, Site investigation for tunnels, Geotechnical considerations of tunneling.	
	2nd	5.2 Alignment of tunnel, Portals and shafts, Bored Tunnel method of Tunnel Construction	
	3rd	5.3 Typical section of tunnels for a national highway.	
12	1st	5.4 Typical section of tunnels for single and double broad gauge railway track.	
	2nd	5.5 Ventilation – Necessity and methods of ventilation: by blowing, exhaust and combination of blowing and exhaust, Dust control in tunnels.	
	3rd	5.6 Drainage method of draining water from tunnels.	
13	1st	5.7 Lighting of tunnels.	
	2nd	5.8 Uses of geo-synthetics in tunnels.	
	3rd	**Revision/Assignment-3**	
14	1st	**Revision**	
	2nd	**Sessional Test -3**	

Lesson plan

Name of the Faculty	**Vijender Kumar**		**Semester**	**5th**
			Lecture per week	**2**
Discipline	**Civil Engineering**			
Subject	**SOLID WASTE MANAGEMENT**		**Delivery Date of Lecture**	**Remarks**
Duration	**20 August 2024 - 29 Nov. 2024 (15 weeks)**			

Week	**Lecture Day**	**Topic (including assignment / test)**		
1st	1st	Introduction of Subject.		
	2nd	1.1 Introduction of Subject, Definition of solid waste		
	3rd	Different solid waste – domestic Waste, commercial waste, industrial waste, market waste,		
2nd	1st	Different solid waste –agricultural waste, biomedical waste,		
	2nd	E-waste, hazardous waste, institutional waste, etc.		
	3rd	1.2 Sources of solid waste		
3rd	1st	Classification of solid waste – hazardous and non- hazardous waste.		
	2nd	1.3 Physical and chemical characteristics of municipal solid waste.		
	3rd	**Storage, Collection and Transportation of Municipal Solid Waste:** 2.1 Collection, segregation, storage and transportation of solid waste.		
4th	1st	2.2 Tools and Equipment - Litter Bin, Broom, Shovels, Handcarts,		
	2nd	Mechanical road sweepers, Community bin - like movable and stationary bin.		
	3rd	2.3 Transportation vehicles with their working capacity -Animal carts, Auto vehicles, Tractors or Trailers, Trucks, Dumpers, Compactor vehicles. Transfer station- meaning, necessity, location.		
5th	1st	2.3 Transportation vehicles with their working capacity -Animal carts, Auto vehicles, Tractors or Trailers, Trucks, Dumpers, Compactor vehicles. Transfer station- meaning, necessity, location.		
	2nd	2.4 Role of rag pickers and their utility for society		
	3rd	Revision of covered syllabus		
6th	1st	Revision of covered syllabus		
	2nd	Revision of covered syllabus		
	3rd	**1st Sessional Test**		
	1st	**Composting of Solid Waste:** 3.1 Concept of composting of waste, Principles of composting process. Factors affecting the composting process.		

7th	2nd	3.2 Methods of composting – Manual Composting – Bangalore method,		
	3rd	Manual Composting – Indore Method.		
8th	1st	Mechanical Composting – Dano Process, Vermi composting.		
	2nd	**Techniques for Disposal of Solid Waste:** 4.1 Solid waste management techniques – solid waste management hierarchy,		
	3rd	waste prevention and waste reduction techniques		
9th	1st	4.2 Land filling technique, Factors to be considered for site selection, Land filling methods-Area method, Trench method and Ramp method,		
	2nd	Leachate and its control, Biogas from landfill,		
	3rd	Advantages and disadvantages of landfill method,		
10th	1st	Recycling of municipal solid waste		
	2nd	4.3 Incineration of waste: Introduction of incineration process,		
	3rd	**2nd Sessional Test**		
11 th	1st	Types of incinerators - Flash, Multiple chamber Incinerators.		
	2nd	Types of incinerators - Flash, Multiple chamber Incinerators.		
	3rd	Products of incineration process with their use.		
12th	1st	Products of incineration process with their use.		
	2nd	Pyrolysis of waste – Definition, Methods.		
	3rd	Pyrolysis of waste – Definition, Methods.		
13th	1st	**Biomedical and E-waste management:** 5.1 Definition of Bio medical Waste**.** Sources and generation of		
	2nd	5.2 Biomedical Waste and its classification		
	3rd	5.3 Bio medical waste Management technologies.		
14th	1st	5.4 Definition, varieties and ill effects of E- waste,		
	2nd	5.5 Recycling and disposal of E- waste.		
	3rd	Revision of covered syllabus		
15th	1st	Revision of covered syllabus		
	2nd	Revision of covered syllabus		
	3rd	**3rd Sessional Test**		

Lesson plan

Name of the Faculty	**Vijender Kumar**		**Semester**	**5th**
			Lecture per week	**2**
Discipline	**Civil Engineering**			
Subject	**Estimation & Costing**		**Delivery Date of Lecture**	**Remarks**
Duration	**20 August 2024 - 29 Nov. 2024 (15 weeks)**			

Week	**Lecture Day**	**Topic (including assignment / test)**		
1st	1st	1.1 Introduction to quantity surveying and its importance.		
	2nd	1.2 Duties of quantity surveyor, 1.3 Types of estimates		
2nd	1st	1.3.1 Preliminary estimates: - Plinth area estimate and Cubic content estimate		
	2nd	1.3.2 Detailed estimates: - Concept, difference between preliminary and detailed estimate		
3rd	1st	1.3.3 Stages of preparation – details of measurement and calculation of quantities and abstract		
	2nd	2.1 Measurement 2.1.1 Units of measurement for various items of work as per BIS: 1200 2.1.2 Rules for measurements		
4th	1st	2.1.3 Different methods of taking out quantities – centre line method and long wall andshort wall method		
	2nd	2.1.3 Different methods of taking out quantities – centre line method and long wall andshort wall method		
5th	1st	2.2 Analysis of Rates 2.2.1 Steps involved in the analysis of rates. Requirement of material, labour, sundries,contractor's profit and overheads		
	2nd	2.2.2 Analysis of rates for finished items when data regarding labour, rates of materialand labour is given: a) Earthwork in excavation in hard/ordinary soil and filling		
6th	1st	b) Concept of lead and lift, c) RCC in roof slab/beam/lintels/columns,		
	2nd	**1st Sessional Test**		
7th	1st	d) Brick masonry in cement mortar Cement Plaster, White washing, painting		
	2nd	3.1 Contractor ship- Meaning of contract, 3.2 Essentials of a contract, 3.3 Various Conditions of contractors		
8th	1st	3.4 Types of contracts, their advantages, dis-advantages and suitability, system of payment.		
	2nd	3.5 Single and two cover-bids; tender, tender forms and documents,		

Lesson plan

Name of the Faculty	**Vijender Kumar**		**Semester**	**5th**
			Lecture per week	**2**
Discipline	**Civil Engineering**			
Subject	**Estimation & Costing**		**Delivery Date of Lecture**	**Remarks**
Duration	**20 August 2024 - 29 Nov. 2024 (15 weeks)**			
Week	**Lecture Day**	**Topic (including assignment / test)**		
9th	1st	Tender notice, submission of tender and deposit of earnest money, security deposit, retention money,maintenance period		
	2nd	3.6 Classification and types of contracting firms/construction companies		
10th	1st	4.1 Introduction to CSR, HSR and calculation of cost based on premium on CSR & HSR		
	2nd	**2nd Sessional Test**		
11 th	1st	4.2 Preparation of Tender Document based on common schedule rates and Haryana schedule rates (CSR & HSR)		
	2nd	4.3 Various Condition of contractors		
12th	1st	4.4 Exercises on writing detailed specifications of different types of building		
	2nd	4.4 Exercises on writing detailed specifications of different types of building		
13th	1st	5.1 Valuation		
	2nd	5.2 Purpose of valuation, principles of valuation		
14th	1st	5.3 Definition of various terms related to valuation like depreciation, sinking fund, salvage and scrap value, market value, fair rent, year's purchase etc.		
	2nd	5.4 Methods of valuation (i) replacement cost method (ii) rental return method		
15th	1st	5.5 Preparation of comparative statement for item rate contract.		
	2nd	**3rd Sessional Test**		

LESSON PLAN

NAME OF FACULTY :- JAGEER KHAN DISCIPLINE :- CIVIL ENGG.

LESSON PLAN DURATION :- 16 WEEKS

TEACHING LOAD :- 1 TURN PER WEEK (4 HOURS /TURN)

Week	Turn	Topic	Covered on Date
1	1	**Preparation of Detailed and Abstract Estimates from Drawings by following (CSR& HSR) rates for:** **1.1 A small residential building with a flat roof comprising of two rooms with W.C., bath, kitchen and verandah** **1.2 1.2 Earthwork for unlined channel**	
2	2	**1.3 WBM road and pre-mix carpeting** 1.4 **Single span RCC slab culvert**	
3	3	**1.5 Earthwork for plain and hill roads** 1.6 **RCC work in beams, slab, column and lintel, foundations** 1.7 **10 users septic tank**	
4	4	**2. Calculation of quantities of materials for** **2.1 Cement mortars of different proportion**	
5	5	**2.2 Cement concrete of different proportion** **2.3 Brick/stone masonry in cement mortar of different proportion**	
6	6	**2.4 Plastering, pointing and painting** **2.5 D.P.C. and flooring**	
7	7	**3. Exercises on preparing tender documents for the following** **3.1 Earth work**	
8	8	Revision of all above topic by viva-voce	

9	9	**3.2 Construction of a small house as per given drawing**	
10	10	**3.3 RCC works**	
11	11	**Revision of above topic by viva-voce**	
12	12	**3.4 Pointing, plastering and flooring** **3.5 White-washing, distempering and painting**	
13	13	**3.6 Wood work including polishing** **3.7 Sanitary and water supply installations**	
14	14	**3.8 False ceiling, aluminum (glazed) partitioning**	
15	15	**3.9 Tile flooring including base course**	
16	16	**Revision of complete syllabus by viva.**	

* Name of the Faculty :	Mr. Mohit Narwal
Discipline	Civil Engg.
Semester	5th
Subject	REINFORCED CEMENT CONCRETE DESIGN
Lecture per week	03 Hrs

Week	Theory		
	Lecture Day	**Topic (Including assignment / Test)**	**Delivery Date**
1	1	1.1 Introduction, 1.1.1 Concept of RCC and PCC, 1.1.2 Difference between RCC and PCC, 1.1.3 Reinforcement Materials: Suitability of steel as reinforcing material	
	2	1.1.3 Reinforcement Materials: Suitability of steel as reinforcing material, 1.1.4 Properties of mild steel and HYSD steel	
	3	1.1.5 Loading on structures as per IS: 875, 1.2 Introduction to following methods of RCC design	
2	4	1.2.1 Working stress method: Definition and basic assumptions.	
	5	1.2.2 Limit state method: Definition and basic assumptions	
	6	1.2.3 Difference between W.S.M and L.S.M	
3	7	2.1.1 Shear as per IS: 456 by working stress method	
	8	2.1.2 Shear strength of concrete without shear reinforcement, nominal shear stress, maximum shear stress and shear reinforcement, functions of vertical stirrups. 2.1.3 Conditions and different forms of providing shear reinforcement	
	9	2.1.4 Concept, purpose and methods for achieving development length 2.1.5 Concept of bond and bond stress.	
4	10	2.2 Concept of Limit State Method 2.2.1 Definitions, methods and assumptions made in limit state of collapse (flexure) 2.2.2 Characteristics strength of materials	
	11	2.2.3 Characteristics loads 2.3.4 Design value for material & loads 2.3.5 Stress blocks parameters.	
	12	Revision	
5	13	**1st Sessional Test**	
	14		
	15		

6	16	3.1 Singly Reinforced beam 3.1.1 Concept of singly R/F beam, neutral axis, depth of Neutral axis, maximum depth of neutral axis, limiting percentage of steel, limiting moment of resistance, value of limiting moment of resistance.	
	17	3.1.2 Types of beam sections- Balanced, under and over R/F sections. 3.1.3 Details of reinforced in beam as per IS: 456	
	18	3.1.4 Design of singly reinforced beam by limit state method and types of problems.	
7	19	3.2 Doubly Reinforced Beams 3.2.1 Concept of doubly reinforced beam, difference between doubly and singly R/F beam.	
	20	3.2.2 Circumstances under which doubly R/F beam are provided. 3.2.3 Concept depth of neutral axis of doubly R/F beam, area of tensile steel and compression steel, ultimate moment of resistance, maximum design stress in compression	
	21	3.2.4 Design of simply supported doubly reinforced rectangular beam by limit state method and types of problems	
8	22	3.3 Behaviour of T beam, Concept of isolated T-beam and L-beam	
	23	4.1 One Way Slab- 4.1.1 Concept of one way slab 4.1.2 General considerations of design of slabs as per IS: 456	
	24	4.1.3 Design steps of simply supported one way slab including sketches showing enforcement details (plan and section) by Limit State Method.	
9	25	4.2 Two Way Slab- 4.2.1 Concept of two way slab	
	26	4.2.2 Difference between one-way slab and two way slab	
	27	4.2.3 Design steps of two-way simply supported slab with corners free to lift, no provisions for Torsional reinforcement by Limit State Method including sketches showing R/F details (plan and two sections)	
10	28	**2nd Sessional Test**	
	29		
	30		
11	31	5.1 Axially Loaded Column 5.1.1 Definition and classification of columns 5.1.2 Effective length of column,	
	32	5.1.3 Specifications for longitudinal and lateral reinforcement as per IS: 456	

	33	5.1.4 Design of axially loaded square, rectangular and circular short columns by Limit State Method including sketching of reinforcement (sectional elevation and plan)	
12	34	5.2 Pre-stressed Concrete 5.2.1 Concept of pre-stressed concrete	
	35	5.2.2 Methods of pre-stressing: pre-tensioning and post-tensioning	
	36	5.2.3 Advantages and disadvantages of pre-stressing	
13	37	5.2.4 Losses in pre-stress	
	38	Practice of Numericals	
	39	Revision	
14	40	3rd Sessional Test	
	41		
	42		
15	43	Practice of Numericals	
	44	Revision	
	45	Revision	

* Name of the Faculty	Mr. Mohit Narwal
Discipline	Civil Engg.
Semester	5th
Subject	REINFORCED CEMENT CONCRETE DESIGN PRACTICAL
Practical per week	06 Hrs

Week		
	Topic (Including assignment / Test)	**Delivery Date**
1	Drawing No. 1: RC Slabs - One way slab	
2	Two way slab	
3	Cantilever Slab.	
4	Drawing No.2 : Beams - Singly and doubly reinforced rectangular beams	
5	**1st Sessional Test**	
6	Cantilever beam (All beams with vertical stirrups)	
7	Drawing No.3 : Columns and Footings Square	
8	Rectangular	
9	Circular Columns with lateral ties and their isolated sloped column footings.	
10	**2nd Sessional Test**	
11	Drawing No. 4 : Portal Frame	
12	Three bay two storey RC portal frame with blow up of column beam junctions.	
13	Drawing No. 5 : Draw at least two sheet using AutoCAD software	
14	**3rd Sessional Test**	
15	Drawing No. 5 : Draw at least two sheet using AutoCAD software	

GOVT. POLYTECHNIC AMBALA

NAME OF FACULTY : Pammi Devi
Discipline : Civil Engg. L: 2
Semester : 3rd
Subject : Surveying-I
Lesson Plan Duration : 15 weeks

Week	Theory	
	Lecture Day	**Topic (including assignment / test)**
1.	1.	1.1 Definition and Purpose of Surveying 1.2 Primary Division of Surveying 1.3 Basic principles of surveying
	2	1.4 Measurements-linear and angular 1.5 Units of measurements 1.6 Instruments used for taking these measurements
2.	1.	1.7 Classification of surveying 1.8 Scales: Engineering Scale, Representative Fraction (RF) and diagonal scale 2.1 Purpose and principles of chain surveying 2.2 Operations in Chain Surveying (Ranging, Measurement, Offsetting)
	2.	2.3 Purpose of compass surveying 2.4 Use of prismatic compass: Setting and taking observations
3.	1.	2.5 Concept of following with simple numerical problems: a) Meridian - Magnetic and true, Arbitrary
	2.	b) Bearing - Magnetic, True and Arbitrary c) Whole circle bearing and reduced bearing
4.	1.	d) Fore and back bearing e) Magnetic dip and declination
	2.	2.6 Local attraction – Problems, causes, detection, errors and corrections,
5.	1.	Revision
	2.	**FIRST SESSIONAL**
6.	1.	3.1 Definition and Purpose of levelling 3.2 Various technical terms used in levelling (level surface, horizontal surface, vertical surface, datum, reduced level, bench marks, line of collimation, axis of the bubble tube, axis of the telescope and vertical axis)
	2.	3.3 Identification of various parts of Auto level, leveling staff types, uses and least count of leveling staff 3.4 Temporary adjustment and permanent adjustment of Auto level
7.	1.	3.5 Concept of back sight, foresight, intermediate sight, change point, to determine reduce levels
	2.	3.6 Level book and reduction of levels by 3.7.1 Height of collimation method and 3.7.2 Rise and fall method (Numerical problems)

8	1.	3.7 Methods of Leveling (Simple levelling, differential levelling, fly levelling, check leveling and profile levelling (L-section and X-section) only (Numerical problems)
	2.	3.8 Problem on reduction of levels, Errors in levelling
9.	1.	4.1 Introduction and Definition of plane table surveying
	2.	4.2 Advantages & Disadvantages of plane table surveying
10.	1.	REVISION
	2.	**SECOND SESSIONAL**
11.	1.	4.3 Equipment used in plane table survey 4.4 Setting of a plane table: (a) Centering (b) Levelling (c) Orientation
	2.	4.5 Methods of plane table surveying (a) Radiation, (b) Traversing 4.6 Errors in plane table survey
12.	1.	5.1 Definition and Purpose of contours 5.2 Contour interval and horizontal equivalent
	2.	5.3 Factors effecting contour interval 5.4 Characteristics of contours
13.	1.	5.5 Methods of contouring: Direct and indirect 5.6 Use of stadia measurements in contour survey
	2.	5.7 Interpolation of contours; use of contour map 5.8 Drawing cross section from a contour map; marking alignment of a road, railway line and a canal on a contour map
14.	1.	**THIRD SESSIONAL**
	2.	PREPARATION FOR FINAL EXAM
15.	1.	DO
	2.	DO

Lesson Plan

Name of the Faculty :	**MOHIT SAINI**		**Discipline :**	**Civil Engineering**
Subject	**SURVEY -I**		**Semester :**	**3rd**
Lesson Plan Duration :	**(20-08-2024 to 29 -11-2024)**			
				L T P
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Week	**Theory**		**Delivery Date of Lecture**	**Whether the Lesson Plan**
	Lecture Day	**Topic**		
		(Including Assignments / Seminar / Group Discussion / Sessional Tests)		
Ist	1st	**I Compass Surveying** i) a) Study of prismatic compass		
	2nd	a) Study of prismatic compass		
2nd	1st	b) Setting the compass and taking observations		
	2nd	b) Setting the compass and taking observations		
3rd	1st	c) Measuring angles between the lines meeting at a point		
	2nd	**c) Measuring angles between the lines meeting at a point**		
4th	1st	II. Levelling i) a) Study of Auto level and levelling staff b) Temporary adjustments of Auto levels		
	2nd	a) Study of Auto level and levelling staff		
5th	1st	b) Temporary adjustments of Auto levels		
	2nd	c) Taking staff readings on different stations from the single setting and finding differences of level between them		
6th	1st	**Internal Viva**		
	2nd	**Sessional Test-1**		
7th	1st	ii) To find out difference of level between two distant points by shifting the instrument		
	2nd	III. Plane Table Surveying		
8th	1st	i) a) Study of the plane table survey equipment		
	2nd	b) Setting the plane table		
th	1st	c) Marking the North direction		

9	2nd	d) Plotting a few points by radiation method		
10th	1st	ii) a) Orientation by - Trough compass - Back sighting		
	2nd	b) Plotting few points by intersection, radiation and resection method		
11th	1st	iii) Traversing an area with a plane table (at least five lines) IV. Layout of Buildings (from given drawing of two room residential building) by use of surveying instruments.		
	2nd	**Internal Viva**		
12th	1st	**Sessional Test -2**		
	2nd	V. Contouring: i) Preparing a contour plan by radial line method by the use of a Auto level.		
13th	1st	V. Contouring: i) Preparing a contour plan by radial line method by the use of a Auto level.		
	2nd	iii) Preparing a contour plan of a Road/Railway track/Canal by taking cross sections.		
14th	1st	iii) Preparing a contour plan of a Road/Railway track/Canal by taking cross sections.		
	2nd	iv) Computation of earth work and reservoir capacity from a contour map		
15th	1st	**Internal Viva**		
	2nd	**Sessional Test -3**		
16th		Revision of syllabus		

Lesson Plan

Name of the Faculty :	**PANKAJ KUMAR**		**Discipline :**	**Civil Engineering**
Subject	**BUILDING CONSTRUCTION (THEORY)**		**Semester :**	**3rd**
Lesson Plan Duration :	**20/08/2024 -29/11/2024 (16 Weeks)**			
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			2 - -	
Week	**Theory**		**Delivery Date of Lecture**	
	Lecture Day	**Topic**		
		(Including Assignments / Seminar / Group Discussion / Sessional Tests)		
Ist	1st	1. Foundation 1.1 Introduction: Definition of a building, Different parts of a building, classification of buildings		
	2nd	1.2 Types of foundation – Shallow foundation (thumb rules for depth and width of foundation) and Deep foundation 1.3 Excavation of foundation – Trenches, Shoring, Underpinning, Timbering and De watering		
2nd	1st	2. Walls 2.1 Classification of walls based on load - Load bearing, non-load bearing, retaining walls		
	2nd	2.2 Classification of walls as per materials of construction 2.3 Partition walls: Constructional details, suitability and uses of brick and wooden partition walls		
3rd	1st	2.4 Scaffolding, construction details and suitability of mason's brick layers and tubular scaffolding		
	2nd	3. Masonry Work 3.1 Glossary of terms used in brick masonry - Header, Stretcher, Queen closer, King closer etc.		
4th	1st	3.2 Brick Masonry Bonds – English and Flemish Bonds 3.3 Construction of brick walls – New wall Construction,		
	2nd	Methods of bonding new brick work with old (Toothing and Raking Methods) 3.4 Mortars: types, selection of mortar and its preparation		
5th	1st	4. Arches and Lintels 4.1 Glossary of terms used in arches -Intrados, Extrados, Crown, Key stone etc.		
	2nd	4.2 Types of Arches – Semi-circular, Segmental and Parabolic arches 4.3 Lintels – Cast-in-situ and pre-cast lintels		
6th	1st	**Sessional Test-1**		
	2nd	5 Doors and Windows 5.1 Glossary of terms used – Door Frame, Door Shutter, Hold fast, Horns, Jamb, Reveal, Soffit, Styles, Rails: Top, Bottom and Lock rails etc. 5.2 Doors and window frames – Materials and Sections, Fixtures and Fasteners		
7th	1st	5.3 Doors – Framed and Panelled door, Glazed or sash door, Flush door, Sliding door, Rolling steel shutter doors 5.4 Windows – Fixed window, Sliding window, Glazed or sash window, Corner window		
	2nd	5.5 Ventilators 6. Damp Proofing and Water Proofing 6.1 Dampness and its ill effects in buildings		

8th	1st	6.2 Sources of dampness in building 6.3 Damp proofing of basement, Plinth and walls, Kitchen, Washroom, Rooof	
	2nd	7. Floors 7.1 Glossary of terms used – Floor finish, Topping, Under layer, Base course, Rubble filling and their purpose	
9th	1st	7.2 Types of floor finishes – Concrete flooring, Ceramic tile flooring, Stone (marble and kota) flooring, Wooden flooring 7.3 Special emphasis on level / slope / reverse slope in bathrooms, toilets, kitchen, balcony	
	2nd	8.1 Types of roofs, concept of flat and pitched roofs	
10th	1st	Rafter, Rag bolt, Ridge, Rain water gutter, Anchoring bolts 8.3 False ceilings – Gypsum false ceiling, POP false Ceiling, PVC false ceiling, Wooden false ceiling, Cellotex false ceiling	
	2nd	**Sessional Test -2**	
11th	1st	9. Stairs 9.1 Glossary of terms used in stairs: Landing, Stringer, Newel, Baluster, Riser	
	2nd	Tread, Width of staircase, Hand-rail, Nosing	
12th	1st	9.2 Types of stairs on the basis of materials used: RCC and Steel stairs	
	2nd	9.3 Various types of layout – Straight flight, Dog legged, Quarter turn, Half turn	
13th	1st	9.4 Ramps and Elevators – Excavation and construction 9.5 Escalators pits and landings – Excavation and construction	
	2nd	10. Surface Finishes 10.1 Plastering – Plain plaster, Stone cladding and Tile work	
14th	1st	10.2 Pointing – Different types of pointing and their methods	
	2nd	10.3 Painting – Preparation of surface, Primer coat and application of paints on wooden, steel and plastered wall surfaces	
15th	1st	10.4 Selection of appropriate paints/finishes for interior and exterior surfaces	
	2nd	**Sessional Test -3**	
16th		Revision of syllabus, display/Intimation of 3rd Sessional marks, Academic evaluation-analysis of Sessionals.	

Lesson Plan

Name of the Faculty :	**PANKAJ KUMAR**		**Discipline :**	**Civil Engineering**
Subject	**BUILDING CONSTRUCTION (P)**		**Semester :**	**3rd**
Lesson Plan Duration :	**20/08/2024 -29/11/2024 (16 Weeks)**			
			L T P	
			4 - -	
Week	**Theory**		**Delivery Date of Lecture**	
	Lecture Day	**Topic**		
		(Including Assignments / Seminar / Group Discussion / Sessional Tests)		
Ist	1st	1. Demonstration of tools and plants used in building construction		
	2nd	1. Demonstration of tools and plants used in building construction		
	3rd	1. Demonstration of tools and plants used in building construction		
	4th	1. Demonstration of tools and plants used in building construction		
2nd	1st	2. To prepare Layout of a building: 2BHK with front veranda		
	2nd	2. To prepare Layout of a building: 2BHK with front veranda		
	3rd	2. To prepare Layout of a building: 2BHK with front veranda		
	4th	2. To prepare Layout of a building: 2BHK with front veranda		
3rd	1st	3. To construct brick bonds (English Bond) in One, One & half and Two brick thick: (a) Walls for L, T and Cross Junction (b) Columns		
	2nd	3. To construct brick bonds (English Bond) in One, One & half and Two brick thick: (a) Walls for L, T and Cross Junction (b) Columns		
	3rd	3. To construct brick bonds (English Bond) in One, One & half and Two brick thick: (a) Walls for L, T and Cross Junction (b) Columns		
	4th	3. To construct brick bonds (English Bond) in One, One & half and Two brick thick: (a) Walls for L, T and Cross Junction (b) Columns		
4th	1st	4. To construct brick bonds (Flemish Bond) in One, One & half and Two brick thick: (a) Walls for L, T and Cross Junction (b) Columns		
	2nd	4. To construct brick bonds (Flemish Bond) in One, One & half and Two brick thick: (a) Walls for L, T and Cross Junction (b) Columns		
	3rd	4. To construct brick bonds (Flemish Bond) in One, One & half and Two brick thick: (a) Walls for L, T and Cross Junction (b) Columns		
	4th	4. To construct brick bonds (Flemish Bond) in One, One & half and Two brick thick: (a) Walls for L, T and Cross Junction (b) Columns		
5th	1st	5. Demonstration of "Timbering of Excavated Trenching" through a model and visit at construction site		
	2nd	5. Demonstration of "Timbering of Excavated Trenching" through a model and visit at construction site		
	3rd	5. Demonstration of "Timbering of Excavated Trenching" through a model and visit at construction site		
	4th	5. Demonstration of "Timbering of Excavated Trenching" through a model and visit at construction site		
6th	1st	6. Demonstration of "Laying Damp Proof Courses" through a model and visit at construction site		
	2nd	6. Demonstration of "Laying Damp Proof Courses" through a model and visit at construction site		
	3rd	6. Demonstration of "Laying Damp Proof Courses" through a model and visit at construction site		
	4th	**Sessional Test-1**		
7th	1st	7. Demonstration of "Construction of Masonry Walls" through a model and visit at construction site		
	2nd	7. Demonstration of "Construction of Masonry Walls" through a model and visit at construction site		
	3rd	7. Demonstration of "Construction of Masonry Walls" through a model and visit at construction site		
	4th	7. Demonstration of "Construction of Masonry Walls" through a model and visit at construction site		

8th	1st	8. Demonstration of "Brick Layers Scaffolding" through a model and visit at construction site	
	2nd	8. Demonstration of "Brick Layers Scaffolding" through a model and visit at construction site	
	3rd	8. Demonstration of "Brick Layers Scaffolding" through a model and visit at construction site	
	4th	8. Demonstration of "Brick Layers Scaffolding" through a model and visit at construction site	
9th	1st	9. Demonstration of "Steel Scaffolding" through a model and visit at construction site	
	2nd	9. Demonstration of "Steel Scaffolding" through a model and visit at construction site	
	3rd	9. Demonstration of "Steel Scaffolding" through a model and visit at construction site	
	4th	construction site	
10th	1st	10. Demonstration of "Laying of Vitrified Tile Flooring" through visit at construction site	
	2nd	10. Demonstration of "Laying of Vitrified Tile Flooring" through visit at construction site	
	3rd	10. Demonstration of "Laying of Vitrified Tile Flooring" through visit at construction site	
	4th	**Sessional Test -2**	
11th	1st	11. Demonstration of "Plastering and Pointing Exercise" through visit at construction site	
	2nd	11. Demonstration of "Plastering and Pointing Exercise" through visit at construction site	
	3rd	11. Demonstration of "Plastering and Pointing Exercise" through visit at construction site	
	4th	11. Demonstration of "Plastering and Pointing Exercise" through visit at construction site	
12th	1st	12. Demonstration of "Constructing RCC work – Foundations, Columns, Beams and Slabs" through visit at construction site	
	2nd	12. Demonstration of "Constructing RCC work – Foundations, Columns, Beams and Slabs" through visit at construction site	
	3rd	12. Demonstration of "Constructing RCC work – Foundations, Columns, Beams and Slabs" through visit at construction site	
	4th	12. Demonstration of "Constructing RCC work – Foundations, Columns, Beams and Slabs" through visit at construction site	
13th	1st	13. Demonstration of "Pre-construction and post construction termite treatment of building and woodwork" through visit at construction site	
	2nd	13. Demonstration of "Pre-construction and post construction termite treatment of building and woodwork" through visit at construction site	
	3rd	13. Demonstration of "Pre-construction and post construction termite treatment of building and woodwork" through visit at construction site	
	4th	13. Demonstration of "Pre-construction and post construction termite treatment of building and woodwork" through visit at construction site	
14th	1st	14. Demonstration of "False Ceiling" through visit at construction site	
	2nd	14. Demonstration of "False Ceiling" through visit at construction site	
	3rd	14. Demonstration of "False Ceiling" through visit at construction site	
	4th	14. Demonstration of "False Ceiling" through visit at construction site	
15th	1st	15. Demonstration of "Interlocking Tiles" through visit at construction site	
	2nd	15. Demonstration of "Interlocking Tiles" through visit at construction site	
	3rd	15. Demonstration of "Interlocking Tiles" through visit at construction site	
	4th	**Sessional Test -3**	
16th		Revision of syllabus, display/Intimation of 3rd Sessional marks, Academic evaluation-analysis of Sessionals.	

Lesson Plan

Name of the Faculty :	**PANKAJ KUMAR**		**Discipline :**	**Civil Engineering**
Subject	**STRUCTURAL MECHANICS (THEORY)**		**Semester :**	**3rd**
Lesson Plan Duration :	**20/08/2024 -29/11/2024 (16 Weeks)**			
			L T P	
			2 - -	
Week	**Theory**		**Delivery Date of Lecture**	
	Lecture Day	**Topic**		
		(Including Assignments / Seminar / Group Discussion / Sessional Tests)		
Ist	1st	1. Properties of Materials 1.1 Classification of materials, elastic materials, plastic materials, ductile materials, brittle materials.		
	2nd	1.2 Introduction to tensile test, compressive test, impact test, fatigue test, torsion test on metals		
2nd	1st	2. Simple Stresses and Strains 2.1 Concept of stress, normal and shear stresses, 2.2 Concept of strain and deformation, longitudinal and transverse strain, poisson's ratio, volumetric strain		
	2nd	2.3 Hooke's law, modulii of elasticity and rigidity, Bulk modulus of elasticity, relationship between the elastic constants.		
3rd	1st	2.4 Stresses and strains in bars subjected to tension and compression.		
	2nd	Extension of uniform bar under its own weight, stress produced in compound bars due to axial load (two or three bars)		
4th	1st	2.5 Stress-strain diagram for mild steel and HYSD steel, mechanical properties, factor of safety. 2.6 Temperature stresses and strains		
	2nd	3. Shear Force and Bending Moment 3.1 Concept of a beam and supports (Hinges, Roller and Fixed), types of beams: simply supported, cantilever, propped, over hang, cantilever and continuous beams (only concept).		
5th	1st	3.2 Types of loads (dead load, live load, snow load, wind load seismic load as per IS Codes etc.) and types of loading (point, uniformly distributed and uniformly varying loads) 3.3 Concept of bending moment and shear force, sign conventions		
	2nd	3.4 Bending Moment and shear force diagrams for cantilever and simply supported subjected to concentrated, uniformly distributed 3.5 Relationship between load, shear force and bending moment, point of maximum bending moment, and point of contraflexure.		
6th	1st	**Sessional Test-1**		
	2nd	4. Moment of Inertia Concept of moment of inertia and second moment of area and radius of gyration		
7th	1st	Theorems of parallel and perpendicular axis		
	2nd	second moment of area of common geometrical sections: rectangle, triangle, circle (without derivations). Second moment of area for L, T and I sections, section modulus.		

8th	1st	5. Bending Stresses in Beams 5.1 Concept of pure/simple bending	
	2nd	5.2 Assumptions made in the theory of simple bending, derivation and application of bending equation to circular cross-section, I section, T&L sections only 5.3 Moment of resistance	
9th	1st	5.4 Calculations of bending stresses in simply supported beam 5.5 Concept of shear stresses in beams, shear stress (introduction only)	
	2nd	6. Slope and Deflection Determination of slope and deflection using Moment Area Theorem for simply supported beam for pointed load and U.D.L	
10th	1st	Numerical problems. (no derivation)	
	2nd	**Sessional Test -2**	
11th	1st	UNIT V 7. Columns	
	2nd	7.1 Theory of columns	
12th	1st	7.1 Theory of columns	
	2nd	7.2 Problem solving using Euler's and Rankine Formula	
13th	1st	7.2 Problem solving using Euler's and Rankine Formula	
	2nd	8. Analysis of Trusses 8.1 Concept of a perfect, redundant, and deficient frames	
14th	1st	8. Analysis of Trusses 8.1 Concept of a perfect, redundant, and deficient frames	
	2nd	8.2 Assumptions and analysis of trusses by: a) Method of joints b) Method of sections	
15th	1st	8.2 Assumptions and analysis of trusses by: a) Method of joints b) Method of sections	
	2nd	**Sessional Test -3**	
16th		Revision of syllabus, display/Intimation of 3rd Sessional marks, Academic evaluation-analysis of Sessionals.	

GOVERNMENT POLYTECHNIC AMBALA

Name Of Faculty: Lalit Dhalk
Discipline: Civil Engineering
Semester: Third Semester
Subject: Concrete Technology
Lesson Plan Duration: 15 Weeks
Work Load (Theory/Practical) Per Week (In Hours): Theory- 02, Practical- 02

Week	Day	Theory Topic/ Assignment/ Test	No.	Practical
1st	1	1. Introduction to Concrete 1.1 Definition of concrete, properties of concrete	1	To determine the physical properties of cement such as fineness, consistency, setting time, soundness, and compressive strength of cement as per IS Codes
	2	Advantages and disadvantages of concrete		
2nd	1	2. Ingredients of Concrete 2.1 Cement: Introduction	2	To determine the physical properties of cement such as fineness, consistency, setting time, soundness, and compressive strength of cement as per IS Codes
	2	2.2 Aggregates: 2.2.1 Classification of aggregates according to size and shape		
3rd	1	2.2.2 Characteristics of aggregates: Particle size and shape, surface texture, specific gravity of aggregate; bulk density, water absorption, surface moisture, bulking of sand, deleterious materials soundness	3	To determine flakiness and elongation Index of coarse aggregate.
	2	2.2.3 Grading of aggregates aggregates: coarse aggregate, fine aggregate; All-in-aggregate; fineness modulus; interpretation of grading charts		
4th	1	2.3 Water: Water Quality requirements as per IS: 456-2000	4	To determine silt content in fine aggregate.
	2	Revision / Class Test		
5th	1	3. Water Cement Ratio 3.1 Hydration of cement principle of water-cement ratio,	5	Determination of specific gravity and water absorption of aggregates.
	2	Duff Abram's Water-cement ratio law: Limitations of water-cement ratio law and its effects on strength of concrete		
6th	1	4. Properties of Concrete 4.1 Properties in the plastic state: Workability, Segregation, Bleeding and Harshness	6	Determination of bulk density and voids of aggregates.

	2	4.1.1 Factors affecting workability, Measurement of workability: slump test, compacting factor; Recommended slumps for placement in various conditions as per IS: 456-2000/SP-23		
7th	1	4.2 Properties in the hardened state: Strength, Durability, Impermeability, Dimensional changes	7	Determination of particle size distribution of fine, coarse and all-in aggregate by sieve analysis (grading of aggregate).
	2	4.3 Concrete mix design (Introduction only)		
8th	1	4.4 Introduction to Admixtures (chemicals and minerals) for improving performance of concrete	8	To determine the bulking of fine aggregates.
	2	Revision/ Class Test		
9th	1	5. Concreting Operations 5.1 Storing of Cement: 5.1.1 Storing of cement in a warehouse 5.1.2 Storing of cement at site	9	To determine workability by slump test and to verify the effect of water, fine aggregate/coarse aggregate ratio and aggregate/Cement ratio on slump.
	2	5.1.3 Effect of storage on the strength of cement 5.1.4 Determination of warehouse capacity for storage of Cement		
10th	1	5.2 Storing of Aggregate: Storing of aggregate at site 5.3 Batching (to be shown during site visit 5.3.1 Batching of Cement	10	To determine workability by slump test and to verify the effect of water, fine aggregate/coarse aggregate ratio and aggregate/Cement ratio on slump.
	2	5.3.2 Batching of aggregate by: □ Volume, using gauge box (farma) selection of proper gauge box □ Weight spring balances and batching machines		
11th	1	5.3.3 Measurement of water 5.4 Mixing: 5.4.1 Hand mixing 5.4.2 Machine mixing - types of mixers, capacities of mixers, choosing the appropriate size of mixers, operation of mixers. 5.4.3 Maintenance and care of mixers	11	Compaction factor test for workability.
	2	6.1 Transportation of concrete: Transportation of concrete using wheelbarrows, transit mixers, chutes, belt conveyors, pumps, tower cranes, hoists, etc. 6.2 Placement of concrete: Checking of formwork, shuttering, and precautions to be taken during placement 6.3.3 Selection of suitable vibrators for different situations		

12th	1	6.4 Finishing concrete slabs - screeding, floating and trowelling 6.5 Curing: 6.5.1 Objective of curing, methods of curing like ponding, membrane curing, steam curing, chemical curing 6.5.2 Duration for curing and removal of formwork	12	Non-destructive test on concrete by: a) Rebound Hammer Test
	2	6.6 Jointing: Location of construction joints, treatment of construction joints, expansion joints in buildings - their importance and location 6.7 Defects in concrete: Identification of defects and methods of removing defects		
13th	1	Revision / Class Test	13	Non-destructive test on concrete by: b) Ultrasonic Pulse Velocity Test
	2	7. Special Concretes (only features) 7.1 Concreting under special conditions, difficulties, and precautions before, during and after concreting 7.1.1 Cold weather concreting 7.1.2 Under water concreting 7.1.3 Hot weather concreting		
14th	1	7.2 Ready mix concrete 7.3 Fly ash concrete	14	To determine the compressive strength of concrete cubes for different grades of concrete
	2	8. Importance and methods of non-destructive tests (introduction only) 8.1. Rebound Hammer Test 8.2. Pulse Velocity method		
15th	1	Revision / Class Test	15	To determine the flexural strength of the concrete beam.
	2	Revision / Class Test		

Lesson Plan

Name of the Faculty :	**Saurabh kumar Mishra**	**Discipline :**	**Civil Engineering**
Subject :	**FLUID MECHANICS**	**Semester :**	**3rd**
Lesson Plan Duration :	**(01 Sept-2024 to 16 Jan 2025**		

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Week	Theory		Delivery Date of Lecture	Whether the Lesson Plan Followed?
	Lecture Day	Topic (including Assignments / Seminar / Group		Yes/No
Ist	1st	**Unit – 1: Introduction** Fluids: Real and ideal fluids, Fluid Mechanics		
	2nd	Hydrostatics, Hydrodynamics, Hydraulics		
	3rd	**Unit – 2: Properties of Fluids** Mass density, specific weight, specific gravity, viscosity		
2nd	1st	Surface tension - cohesion, adhesion and, capillarity, vapour pressure and compressibility.		
	2nd	**Unit – 3: Hydrostatic Pressure** Pressure, intensity of pressure, pressure head, Pascal's law and its applications		
	3rd	Total pressure, resultant pressure, and centre of pressure.		
3rd	1st	**Unit- 4 :Measurement of Pressure :**Atmospheric pressure, gauge pressure, vacuum pressure and absolute pressure.		
	2nd	Piezometer, simple manometer and differential manometer		
	3rd	Bourden gauge and dead weight pressure gauge		
4th	1st	**Unit -5 Fundamentals of Fluid Flow:**Types of Flow: Steady and unsteady flow, laminar and turbulent flow, uniform and non-uniform flow		
	2nd	Discharge and continuity equation (flow equation) {No derivation}		
	3rd	Simple numerical problems.		
5th	1st	Types of hydraulic energy: Potential energy		
	2nd	kinetic energy		
	3rd	pressure energy		
6th	1st	**Sessional Test -1**		
	2nd	Bernoulli's theorem; statement		
	3rd	Description of bernoullis theorem(without		
7th	1st	Numerical problems.		
	2nd	**Unit-6 Flow Measurements:**Brief description with simple numerical problems of Venturimeter a		
	3rd	Pitot tube ,Orifices		
8th	1st	Mouthpieces & Current meters		
	2nd	Notches and weirs		
	3rd	**Unit -7 Flow through Pipes:**Definition of pipe flow; Reynolds number		
9th	1st	laminar and turbulent flow - explained through Reynold's experiment		
	2nd	Critical velocity and velocity distributions in a pipe for laminar flow		

	3rd	Head loss in pipe lines due to friction		
10 th	1st	sudden expansion in pipes		
	2nd	sudden contraction, entrance, exit in pipes		
	3rd	obstruction and change of direction (No derivation of formula)		
11 th	1st	**Sessional Test -2**		
	2nd	Simple numerical problems		
	3rd	Hydraulic gradient line and total energy line		
12 th	1st	Pipes in series and parallel		
	2nd	Water hammer phenomenon and its effects (only definition and description)		
	3rd	**CH-8 Flow through open channels:** Definition of an open channel, uniform flow and non-uniform flow		
13th	1st	Discharge through channels using (i)Chezy's formula (no derivation) (ii)Manning's form		
	2nd	Most economical channel sections (no derivation, only simple numerical problems)(i) Rectangular(ii) Trapezoidal		
	3rd	Head loss in open channel due to friction		
14th	1st	**CH-9 Hydraulic Pumps:**Introduction		
	2nd	Hydraulic pump		
	3rd	Reciprocating pump		
15th	1st	**Sessional Test -3**		
	2nd	Numerical problems.		
	3rd	Centrifugal pumps (No numericals and derivations) (may be demonstrated with the help of working models)		
16th	Revision of syllabus , Display /Intimation of 3rd Sessional marks, Academic evaluation -analysis of sessionals.			

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mula (no derivation)

Lesson Plan

Name of the Faculty : **Saurabh kumar Mishra** **Discipline :** **Civil Engineering** **L** **T** **P**

Semester : **3rd** **-** **-** **2**

Subject : **FLUID MECHANICS (PRACTICALS)**

Lesson Plan Duration : **(01 Sept-2024 to 16 Jan 2025)**

Week	Practical	Delivery Date of Practical		Whether the Lesson Plan Followed? **Yes/No**
		Expected	Actual	
1st	To verify Bernoulli's Theorem			
2nd	To verify Bernoulli's Theorem			
3rd	To determine coefficient of velocity (C_v), Coefficient of discharge (C_d) Coefficient of contraction (C_c) of an orifice and verify the relation between them			
4th	To determine coefficient of velocity (C_v), Coefficient of discharge (C_d) Coefficient of contraction (C_c) of an orifice and verify the relation between them			
5th	**Internal Viva Voce – 1**			
6th	To perform Reynold's experiment			
7th	To perform Reynold's experiment			
8th	To verify loss of head in pipe flow due to a. Sudden enlargement b. Sudden contraction c. Sudden bend			
9th	To verify loss of head in pipe flow due to a. Sudden enlargement b. Sudden contraction c. Sudden bend			
10th	**Internal Viva Voce – 2**			
11th	Demonstration of use of current meter and pitot tube			
12th	Demonstration of use of current meter and pitot tube			
13th	To determine coefficient of discharge of a rectangular notch and triangular notch			
14th	To determine coefficient of discharge of a rectangular notch and triangular notch			
15th	**Internal Viva Voce – 3**			

GOVERNMENT POLYTECHNIC AMBALA

Name Of Faculty: Lalit Dhalk

Discipline: Civil Engineering

Semester: Third Semester

Subject: MooC (Renewable Energy)

Lesson Plan Duration: 15 Weeks

Work Load (Theory/Practical) Per Week (In Hours): Theory- 02, Practical- 00

Week	Day	Theory
		Topic (including Assignment / Test)
1st	1st	**Introduction of the subject matters / its practical applications and necessities.**
	2nd	**Unit-1: Introduction to Renewable Energy** Importance of renewable energy in addressing climate change and energy security
2nd	3rd	Basic principles of renewable energy conversion
	4th	**Unit-2: Hydropower** Types of hydropower systems (small-scale to large-scale)
3rd	5th	Components of hydropower plants
	6th	Environmental and social considerations
4th	7th	**Unit-3: Solar Energy** Solar radiation and its measurement
	8th	Photovoltaic(PV) technology and systems
5th	9th	Solar thermal systems and applications
	10th	**Revision/Quarries/Assignment-I**
6th	11th	**Sessional Test -I**
	12th	**Unit-4: Wind Energy** Wind energy resource assessment
7th	13th	Wind turbine technology and components
	14th	Wind farm design and operation
8th	15th	Wind farm design and operation
	16th	**Unit-5: Biomass Energy** Biomass sources and types
9th	17th	Bioenergy conversion processes (biogas, biofuels, etc.)
	18th	Bioenergy conversion processes (biogas, biofuels, etc.)
10th	19th	Anaerobic digestion and gasification
	20th	**Revision/Quarries/Assignment-II**
11th	21th	**Sessional Test -II**
	22th	**Unit-6: Ocean Energy** Tidal and Wave Energy
12th	23th	Ocean thermal energy conversion (OTEC) technologies
	24th	Challenges and opportunities in harnessing ocean energy
13th	25th	**Unit-7: Environmental Impact and Sustainability** Environmental benefits and challenges of renewable energy
	26th	Life cycle analysis
14th	27th	Carbon foot print assessment
	28th	Carbon foot print assessment

15th	29th	**Revision/Quarries/Assignment-III**
	30th	**Sessional Test -III**