Govt. Polytechnic Talwar (H.P.)
Lesson Planning (Theory)

Branch : CIVIL ENGG Semester : 4TH

Subject : Transportation Engineering Session : JAN- MAY 2025

Teacher: ANUJ RANA Class Room: A-202

S.No.	No. of Lectures	Chapter/ Unit Description	Detail of Contents	Reference Resources	Remarks
1	4	**Overview of Highway Engineering**	1.1 Role of transportation in the development of nation, Scope and Importance of roads in India and its Characteristics. 1.2 Different modes of transportation – land way, waterway, airway. Merits and demerits of roadway and Railway. 1.3 General classification of roads. 1.4Selection and factors affecting road alignment.	R1	
2	10	**Geometric Design of Highway**	2.1 Camber: Definition, purpose, types as per IRC – recommendations. 2.2Kerbs: Road margin, road formation, right of way. 2.3 Design speed and various factors affecting design speed as per IRC – recommendations. 2.4 Gradient: Definition, types as per IRC – Recommendations. 2.5 Sight distance (SSD): Definition, types IRC – recommendations, simple numerical. 2.6 Curves: Necessity, types: Horizontal, vertical curves. 2.7 Super elevation: Definition, formula for calculating minimum and maximum Super elevation and method of providing super-elevation. 2.8 Standards cross-sections of national highway in embankment and cutting.	R1	
3	12	**Construction of Road Pavements**	3.1 Types of road materials and their Tests – Test on aggregates- Flakiness and Elongation Index tests, Angularity Number test, test on Bitumen- penetration, Ductility, Flash and Fire point test and Softening point test. 3.2 Pavement – Definition, Types, Structural Components of pavement and their functions 3.3 Construction of WBM road. Merits and demerits of WBM & WMM road. 3.4 Construction of Flexible pavement / Bituminous Road, Types of Bitumen and its proper- ties, Emulsion, Cutback, Tar, Terms used in BR- prime coat, tack coat, seal coat, Merits and Demerits of BR. 3.5 Cement concrete road methods of construction, Alternate and Continuous Bay Method, Construction joints, filler and sealers, merits and demerits of concrete roads. Types of joints.	R1	
4	4	**Basics of Railway Engineering**	4.1 Classification of Indian Railways, zones of Indian Railways. 4.2 Permanent way: Ideal requirement, Components; Rail Gauge, types, factors affecting selection of a gauge. 4.3 Rail, Rail Joints - requirements, types. 4.4 Creep of rail causes and prevention.	R2	
5	12	**Track geometrics, Construction and Maintenance**	5.1 Alignment- Factors governing rail alignment. 5.2 Track Cross sections – standard cross section of single and double 5.3 line in cutting and embankment. Important terms- permanent land, formation width, side drains, 5.4 Railway Track Geometrics: Gradient, curves- types and factors affecting, grade compensation, super elevation, limits of Super elevation on curves, cant deficiency, negative cant, coning of wheel, tilting of rail. 5.5 Branching of Tracks, Points and crossings, Turn out- types, components, functions and inspection. Track junctions: crossovers, scissor cross over, diamond crossing, track triangle. 5.6 Station -Purpose, requirement of railway station, important technical	R2	

			terms, types of rail- way station, factors affecting site selection for railway station. 5.7 Station yard: Classification- Passenger, goods, locomotive and marshalling yards. Function & drawbacks of marshalling yards. 5.8 Track Maintenance- Necessity, Classification, Tools required for track maintenance with their functions, Organization of track maintenance, Duties of permanent way inspector, gang mate and Key man.		

REFERENCE RESOURCES

- R1- L.R. Kadiyali, Transportation Engineering, Khanna Book Publishing Co., Delhi (ISBN: 978- 93- 82609- 858) Edition 2018
- R-2 – Saxena S C and Arora S P, A Textbook of Railway Engineering, Dhanpat Rai Publication

Signature of Teacher

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Govt. Polytechnic Talwar (H.P.)
Lesson Planning (Theory)

Branch : CIVIL ENGG Semester : 4TH

Subject : Railways Bridges and Tunnels Session : JAN- MAY 2025

Teacher: RANA KUNAL Class Room: A-202

S.No.	No. of Lectures	Chapter/ Unit Description	Detail of Contents	Reference Resources	Remarks
1	14	RAILWAYS	1.1 Introduction to Indian Railways 1.2 Railways surveys: Factors influencing the railways route, brief description of various types of railway survey 1.3 Classification of permanent way describing its component part 1.4 Rail Gauge; Definition, types, practice in India 1.5 Rail – types of rails 1.6 Rail Fastening: Rail joints, types of rail joints, fastening for rails, Fish plates, spikes bearing plates 1.7 Sleepers: Functions of sleepers, types of sleepers, requirements of an ideal material of Sleepers. 1.8 Ballast: Function of ballast, requirements of an ideal material of ballast 1.9 Crossing and signalling: Brief description regarding different types of crossing/signalling 1.10 Maintenance of track: Necessity, track fixtures; maintenance and boxing of ballast, maintenance gauges, tools. 1.11 Drains, methods of construction.	R1	
2	18	BRIDGES	2.1 Introduction 2.2Bridge–its function and component parts, difference between a bridge and A culvert 2.3 Classification of Bridges 2.4Their structural elements and suitability: 2.5 According to life-permanent and temporary 2.6 According to deck level–Deck, through and semi-through 2.7 According to material–timber, masonry, steel, RCC, pre-stressed 2.8 IRC classification 2.9 Bridge Foundations: Introduction to open foundation pile foundation, Well foundation 2.10 Piers, Abutments and Wing walls 2.11 Piers–definition, parts; types–solid (masonry and RCC), open 2.12 Abutment sand wing walls–definition, types of abutment (straight and tee), abutment with wing walls (straight, splayed, return and curved) 2.13 Bridge bearings Purpose of bearing; types of bearing–fixed plate, rocker and roller, 2.14 Maintenance of Bridges 2.15 Inspection of bridges 2.16 Routine maintenance	R2	
3	10	TUNNELS	3.1 Definition and necessity of tunnels 3.2Typical section of tunnels for a national highway and single and double broad gauge railway track. 3.3 Ventilation-necessity and methods of ventilation, by blowing, exhaust and combination of blowing and exhaust 3.4 Drainage method of draining water in tunnels 3.5 Lighting in tunnels & lining of tunnels.	R3	

REFERENCE RESOURCES

- R1- Rangwala,SC; " Railway Engineering", Anand Charotar Book Stall
- R-2 – Algaia, JS "Bridge Engineering", Anand Charotar Book Stall
- R-3– .Subhash C Saxena " Tunnal Engineering Dhanpat Rai and Sons

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Govt. Polytechnic Talwar (H.P.)

Lesson Plan (Theory)

Branch : CIVIL ENGG Semester : 4TH

Subject : Building Planning and Drawing Session : JAN- MAY 2025

Teacher: NAVEEN BHARTI Class Room: A-202

S.No.	No. of Lectures	Chapter/ Unit Description	Detail of Contents	Reference Resources	Remarks
1	2	**Conventions and Symbols**	1.1 Conventions as per IS 962, symbols for different materials such as earthwork, brickwork, stonework, concrete, woodwork, and glass. 1.2 Graphical symbols for doors and windows, Abbreviations, symbols for sanitary and electrical installations. 1.3 Types of lines-visible lines, centre line, hidden line, section line, dimension line, extension line, pointers, arrowhead, or dots. Appropriate size of lettering and numerals for titles, sub-titles, notes, and dimensions. 1.4 Types of scale- Monumental, Intimate, criteria for Proper Selection of scale for various types of drawing. 1.5 Sizes of various standard papers/sheets. 1.6 Reading and interpreting readymade Architectural building drawing (To be procured from Architect, Planning Consultants, Planning Engineer)	R1	
2	4	**Planning of Building**	2.1 Principles of planning for Residential and Public building- Aspect, Prospect, Orientation, Grouping, Privacy, Elegance, Flexibility, Circulation, Furniture requirements, Sanitation, Economy. 2.2 Space requirement and norms for minimum dimension of different units in the residential and public buildings as per IS 962. 2.3 Rules and byelaws of sanctioning authorities for construction work. 2.4 Plot area built up area, super built-up area, plinth area, carpet area, floor area and FAR (Floor Area Ratio). 2.5 Line plans for residential building of minimum three rooms including water closet (WC), bath and staircase as per principles of planning. Line plans for public building-school building, primary health centre, restaurant, bank, post office, hostel, Function Hall and Library.	R1	
3	4	**Drawing of Load Bearing Structure**	3.1 Drawing of Single storey Load Bearing residential building (2 BHK) with staircase. 3.2 Data drawing –plan, elevation, section, site plan, schedule of openings, construction notes with specifications, area statement, Planning and design of staircase- Rise and Tread for residential and public building. 3.3 Working drawing – developed plan, elevation, section passing through staircase or WC and bath. 3.4 Foundation plan of Load bearing structure.	R1	
4	4	**Drawing of Framed Structure**	4.1 Drawing of Two storeyed Framed Structure (G+1), residential building (2 BHK) with stair- case. 4.2 Data drawing – developed plan, elevation, section, site plan, schedule of openings, construction notes with specifications, area statement. Planning and design of staircase- Rise and Tread for residential and public building. 4.3 Working drawing of Framed Structure – developed plan, elevation, section passing through staircase or WC and bath. 4.4 Foundation plan of Framed Structure. 4.5 Details of RCC footing, Column, Beam, Chajjas, Lintel, Staircase, and slab. 4.6 Drawing with CAD- Draw commands, modify commands, layer commands.	R1	

REFERENCE RESOURCES

R1 - • Swamy, Kumara; Rao, N, Kameshwara, A. Building Planning and Drawing, Charotar Publication, Anand.

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Govt. Polytechnic Talwar (H.P.)

Lesson Plan (Theory)

Branch : CIVIL ENGG Semester : 4TH

Subject : Construction Management Session : JAN- MAY 2025

Teacher: NAVEEN BHARTI Class Room: A-202

S.No.	No. of Lectures	Chapter/ Unit Description	Detail of Contents	Reference Resources	Remarks
1	8	**Construction industry and management**	• Organization-objectives, principles of organization, types of organization: government/public and private construction industry, Role of various personnel in construction organization • Agencies associated with construction work- owner, promoter, builder, designer, architects. • Role of consultant for various activities: Preparation of Detailed Project Report (DPR), Monitoring of progress and quality, settlement of disputes.	R1	
2	10	**Site Layout**	• Principles governing site layout. • Factors affecting site layout. • Preparation of site layout. • Land acquisition procedures and providing compensation.	R1	
3	13	**Planning and scheduling**	• Identifying broad activities in construction work & allotting time to it, Methods of Scheduling, • Development of bar charts, Merits & limitations of bar chart. • Elements of Network: Event, activity, dummy activities, Precautions in drawing Network, Numbering the events. • CPM networks, activity time estimate, Event Times by forward & backward pass calculation, start and finish time of activity, project duration. Floats: Types of Floats-Free, independent, and total floats, critical activities and critical path, • Purpose of crashing a network, Normal Time and Cost, Crash Time and Cost, Cost slope, • Optimization of cost and duration. • Material Management- Ordering cost, inventory carrying cost, Economic Order Quantity Store management, various records related to store management, inventory control by ABC technique, Introduction to material procurement through portals (e.g. www.inampro.nic.in)	R1	
4	6	**Construction Contracts and Specifications**	• Types of Construction contracts • Contract documents, specifications, general special conditions • Contract Management, procedures involved in arbitration and settlement (Introduction only)	R1	
5	5	**Safety in Construction**	• Safety in Construction Industry—Causes of Accidents, Remedial and Preventive Measures. • Labour Laws and Acts pertaining to Civil construction activities (Introduction only)	R1	

REFERENCE RESOURCES

R1 - • Gahlot,P.S. and Dhir, B.M Construction planning and management New Age International

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Govt. Polytechnic Talwar (H.P.)

Lesson Planning (Theory)

Branch : CIVIL ENGG Semester : 4TH

Subject : Advanced Surveying Session : JAN- MAY 2025

Teacher: ANUJ RANA Class Room: A-202

S.No.	No. of Lectures	Chapter/ Unit Description	Detail of Contents	Reference Resources	Remarks
1	7	**Plane Table Surveying**	1.1 Principles of plane table survey. 1.2 Accessories of plane table and their use, Telescopic alidade. 1.3 Setting of plane table; Orientation of plane table - Back sighting and Magnetic meridian method. 1.4 Methods of plane table surveys- Radiation, Intersection and Traversing. 1.5 Merits and demerits of plane table survey.	R1	
2	12	**Theodolite Surveying**	2.1 Types and uses of Theodolite, Components of transit Theodolite and their functions, Reading the Vernier of transit Theodolite. 2.2 Technical terms- Swinging, Transiting, Face left, Face right. 2.3 Fundamental axes of transit Theodolite and their relationship 2.4 Temporary adjustment of transit Theodolite. 2.5 Measurement of horizontal angle- Direct and Repetition method, Errors eliminated by method of repetition. 2.6 Measurement of magnetic bearing of a line, Prolonging and ranging a line, deflection angle. 2.7 Measurement of vertical Angle. 2.8 Theodolite traversing by included angle method and Deflection angle method. 2.9 Traverse Computation-Latitude, Departure, Consecutive coordinates, independent coordinates.	R1	
3	12	**Tacheometric surveying and Curve setting**	3.1 Principles of Tacheometry, Tacheometer, and its component parts, Anallatic lens. 3.2 Tacheometric formula for horizontal distance with telescope horizontal and staff vertical. 3.3 Field method for determining constants of tacheometer, determining horizontal and vertical distances with tacheometer by fixed hair method and staff held vertical, Limitations of tacheometry. 3.4 Types of curves used in roads. Designation of curves. 3.5 Setting simple circular curve by offsets from long chord and Rankine's method of deflection angles.	R1	
4	6	**Advanced surveying equipment**	4.1 Principle of Electronic Distance Meter (EDM), its component parts and their Functions, use of EDM. 4.2 Use of micro-optic Theodolite and Electronic Digital Theodolite. 4.3 Use of Total Station, Use of function keys.	R1	
5	5	**Remote sensing, GPS and GIS**	5.1 Remote Sensing – Overview, Remote sensing system, Applications of remote sensing in Civil engineering, land use / Land cover, mapping, disaster management. 5.2 Use of Global Positioning System (G.P.S.) instruments. 5.3 Geographic Information System (GIS): Overview, Components, Applications, Software for GIS. 5.4 Introduction to Drone Surveying.	R1	

REFERENCE RESOURCES

- R1 - Duggal, S. K., Survey I and Survey II, Tata McGraw Hill Education Pvt. Ltd., Noida

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Govt. Polytechnic Talwar (H.P.)
Lesson Planning (Theory)

Branch : CIVIL ENGG Semester : 4TH

Subject : Hydraulics Session : JAN- MAY 2025

Teacher: HARISH KUMAR Class Room: A-202

S.No.	No. of Lectures	Chapter/ Unit Description	Detail of Contents	Reference Resources	Remarks
1	8	**Pressure measurement and Hydrostatic pressure**	1.1 Technical terms used in Hydraulics –fluid, fluid mechanics, hydraulics, hydrostatics, and hydrodynamics - ideal and real fluid, application of hydraulics. 1.2 Physical properties of fluid – density-specific volume, specific gravity, surface tension, capillarity, and viscosity-Newton's law of viscosity. 1.3 Various types of pressure – Atmospheric Pressure, Gauge Pressure, Absolute Pressure, Vacuum Pressure. Concept of Pressure head and its unit, Pascal's law of fluid pressure and its uses. 1.4 Measurement of differential Pressure by different methods. 1.5 Variation of pressure with depth, Pressure diagram, hydrostatic pressure and center of pressure on immersed surfaces and on tank walls. 1.6 Determination of total pressure and center of pressure on sides and bottom of water tanks, sides and bottom of tanks containing two liquids, vertical surface in contact with liquid on either side	R1	
2	11	**Fluid Flow Parameters**	2.1 Types of flow – Gravity and pressure flow, Laminar, Turbulent, Uniform, Non-uniform, Steady, Unsteady flow. Reynolds number. 2.2 Discharge and its unit, continuity equation of flow. 2.3 Energy of flowing liquid: potential, kinetic and pressure energy. 2.4 Bernoulli's theorem: statement, assumptions, equation.	R1	
3	12	**Flow through pipes**	3.1 Minor losses in pipe: loss at entrance, exit, sudden contraction, sudden enlargement, and fittings. 3.2 Flow through pipes in series, pipes in parallel and Dupuit's equation for equivalent pipe. 3.3 Hydraulic gradient line and total energy line.	R1	
4	6	**Flow through Open Channel**	4.1 Geometrical properties of channel section: Wetted area, wetted perimeter, hydraulic radius for rectangular and trapezoidal channel section. 4.2 Determination of discharge by Chezy's equation and Manning's equation. 4.3 Conditions for most economical rectangular and trapezoidal channel section. 4.4 Discharge measuring devices: Triangular and rectangular Notches. 4.5 Velocity measurement devices: current meter, floats and Pitot's tube. 4.6 Specific energy diagram, Froude's Number.	R1	
5	5	**Hydraulic Pumps**	5.1 Concept of pump, Types of pumps - centrifugal, reciprocating, submersible. 5.2 Suction head, delivery head, static head, Manometric head. 5.3 Selection and choice of pump.	R1	

REFERENCE RESOURCES

- R1 - • Modi, P. N. and Seth, S.M., Hydraulics and Fluid Mechanics, Standard book house, Delhi.

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Govt. Polytechnic Talwar (H.P.)

Lesson Plan (Practical)

Branch : CIVIL ENGG Semester : 4TH

Subject : Building Planning and Drawing Lab Session : JAN- MAY 2025

Teacher: NAVEEN BHARTI Class Room: A-202

S.No.	No. of Lectures	Chapter/ Unit Description	Detail of Contents	Reference Resources	Remarks
1	4	Drawing No. 1	Draw various types of lines, graphical symbols for materials, doors and windows, symbols for sanitary, water supply and electrical installations and write abbreviations as per IS 962.	R1	
2	6	Drawing No. 2	Draw line plan to suitable scale (1BHK, staircase, WC and Bathroom)	R1	
3	6	Drawing No. 3	Draw line plans to suitable scale for the following Public Buildings (School Building and Community Hall).	R1	
4	10	Drawing No. 4	Draw submission drawing to the scale 1:100 of a single storey load bearing residential building (2BHK) with flat Roof and staircase showing a. Developed plan and elevation b. Section passing through Stair or W.C. and Bath c. Foundation plan and schedule of openings. d. Site plan (1:200), area statement, construction notes.	R1	
5	10	Drawing No. 5	Draw submission drawing, to the scale of 1:100, of (G+1) Framed Structure Residential Building (2BHK) with Flat Roof and staircase showing: a. Developed plan b. Elevation. c. Section passing through Staircase, WC and Bath d. Site plan (1:200) and area statement e. Schedule of openings and Construction Notes.	R1	
6	10	Drawing No. 6	Draw working drawing for above mentioned drawing at serial number 5 showing: a. Foundation plan to the scale 1:50 b. Detailed enlarged section of RCC column and footing with plinth filling. c. Detailed enlarged section of RCC Beam, Lintel and Chajjas.	R1	
7	10	Drawing No. 7	Draw the above-mentioned drawing at serial number 5 using CAD software and enclose the printout. a. Developed plan b. Elevation c. Section passing through Staircase, W.C. and Bath d. Foundation plan. e. Site plan (1:200), area statement, Schedule of openings and construction notes.	R1	

REFERENCE RESOURCES

R1 - Swamy, Kumara; Rao, N, Kameshwara, A. Building Planning and Drawing, Charotar Publication, Anand.

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Govt. Polytechnic Talwar (H.P.)

Lesson Planning (Practical)

Branch : CIVIL ENGG Semester : 4TH

Subject : Advanced Surveying Lab Session : JAN- MAY 2025

Teacher: ANUJ RANA Class Room: A-202

S.No.	No. of Lectures	Chapter/ Unit Description	Detail of Contents	Reference Resources	Remarks
1	4	Practical No. 1	Use plane table survey to prepare plans of a plot of seven-sided closed traverse by Radiation Method.	R1	
2	4	Practical No. 2	Use plane table survey to prepare plans, locate details by Intersection Method	R1	
3	4	Practical No. 3	Use plane table survey to prepare plans, locate details by Traversing Method.	R1	
4	4	Practical No. 4	Use plane table survey to carry out Survey Project for closed traverse for minimum five sides around a building.	R1	
5	4	Practical No. 5	Use transit theodolite to measure Horizontal and Vertical angle by Direct Method.	R1	
6	4	Practical No. 6	Plot the traverse on A1 size imperial drawing sheet for the collected data from preceding Theodolite Survey Project.	R1	
7	4	Practical No. 7	Use Theodolite as a Tacheometer to compute reduced levels and horizontal distances.	R1	
8	4	Practical No. 8	Set out a circular curve by Rankine's Method of Deflection Angles.	R1	
9	4	Practical No. 9	Use micro-optic Theodolite to Measure Horizontal angle by Direct Method.	R1	
10	2	Practical No. 10	Use EDM to measure horizontal distance.	R1	
11	4	Practical No. 11	Use Total station instrument to measure horizontal distances.	R1	
12	4	Practical No. 12	Use Total station instrument to measure vertical angle.	R1	
13	4	Practical No. 13	Use Total station instrument to carry out Survey Project for closed traverse for minimum five sides.	R1	
14	4	Practical No. 14	Plot the traverse on A1 size imperial drawing sheet for the collected data from preceding Total Station Survey Project.	R1	
15	2	Practical No. 15	Use GPS to locate the coordinates of a station.	R1	

REFERENCE RESOURCES

R1 - • Duggal, S. K., Survey I and Survey II, Tata McGraw Hill Education Pvt. Ltd., Noida

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Govt. Polytechnic Talwar (H.P.)

Lesson Planning (Practical)

Branch : CIVIL ENGG Semester : 4TH

Subject : Transportation Engineering Lab Session : JAN- MAY 2025

Teacher: ANUJ RANA Class Room: A-202

S.No.	No. of Lectures	Chapter/ Unit Description	Detail of Contents	Reference Resources	Remarks
1	2	Practical No. 1	Draw the sketches showing standard cross sections of Expressways, Freeways, NH/SH, MDR/ODR	R1	
2	2	Practical No. 2	Flakiness and Elongation Index of aggregates.	R1	
3	2	Practical No. 3	Angularity Number of aggregates.	R1	
4	2	Practical No. 4	Aggregate impact test	R1	
5	2	Practical No. 5	Los Angeles Abrasion test	R1	
6	2	Practical No. 6	Aggregate crushing test	R1	
7	2	Practical No. 7	Softening point test of bitumen.	R1	
8	2	Practical No. 8	Penetration test of bitumen.	R1	
9	2	Practical No. 9	Flash and Fire Point test of bitumen.	R1	
10	2	Practical No. 10	Ductility test of Bitumen.	R1	
11	2	Practical No. 11	Visit the constructed road for visual inspection to identify defects and suggest remedial measures.	R1	
12	2	Practical No. 12	Prepare the photographic report containing details for experiment **No. 11.**	R1	
13	2	Practical No. 13	Visit the hill road constructed site to understand its components.	R1	
14	2	Practical No. 14	Prepare the photographic report containing details for experiment **No. 13**	R1	

REFERENCE RESOURCES

R1 - • L.R. Kadiyali, Transportation Engineering, Khanna Book Publishing Co., Delhi Edition 2018

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Govt. Polytechnic Talwar (H.P.)

Lesson Planning (Practical)

Branch : CIVIL ENGG Semester : 4TH

Subject : Hydraulics Lab Session : JAN- MAY 2025

Teacher: HARISH KUMAR Class Room: A-202

S.No.	No. of Lectures	Chapter/ Unit Description	Detail of Contents	Reference Resources	Remarks
1	2	Practical No. 1	Use piezometer to measure pressure at a given point.	R1	
2	2	Practical No. 2	Use U tube differential manometer to measure pressure difference between two given points.	R1	
3	2	Practical No. 3	Find the resultant pressure and its position for given situation of liquid in a tank.	R1	
4	2	Practical No. 4	Use Reynold's apparatus to determine type of flow.	R1	
5	3	Practical No. 5	Use Bernoulli's apparatus to apply Bernoulli's theorem to get total energy line for a flow in a closed conduit of varying cross sections.	R1	
6	2	Practical No. 6	Determine minor losses in pipe fittings due to sudden contraction and sudden enlargement.	R1	
7	3	Practical No. 7	Determine minor losses in pipe fitting due to Bend and Elbow.	R1	
8	2	Practical No. 8	Calibrate Venturimeter to find out the discharge in a pipe.	R1	
9	2	Practical No. 9	Calibrate the Orifice to find out the discharge through a tank	R1	
10	2	Practical No. 10	Use Current meter to measure the velocity of flow of water in open channel.	R1	
11	2	Practical No. 11	Use Pitot tube to measure the velocity of flow of water in open channel.	R1	
12	2	Practical No. 12	Use triangular notch to measure the discharge through open channel.	R1	
13	2	Practical No. 13	Use Rectangular notch to measure the discharge through open channel.	R1	

REFERENCE RESOURCES

- R1 - • Modi, P. N. and Seth, S.M., Hydraulics and Fluid Mechanics, Standard book house, Delhi.

Signature of Teacher

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LESSON PLAN

Name of Teacher :- Meenakshi Saini **Subject:** Essence of Indian Knowledge & Tradition **Class:** 4th Semester Civil Engg.

S. No.	Month	Week	Date	Name of Chapter	Contents to be taught	Remarks
1	January	5th Week	29,30	Unit 1: Indian Knowledge System (IKS)	A. Introduction and Function of Indian Knowledge System (IKS). B. The Basic Structure of Indian Knowledge System (IKS) (only Introduction)	
2	February	2nd Week	5,6		1. The 4 Vedas, Namely (Rigveda), (Yajurveda), (Samaveda), (Atharvaveda) 2. The 4 UpVedas, namely (Ayurveda (healthcare), (Dhanurveda (archery), (Gandharva-veda (dance, music etc.) and (Sthapatyaveda (architecture).	
3		3rd Week	13		3. The 6 Vedagangs, namely Shiksha , Kalpa , Vykaraṇa , Chhandas , Nirukta , and Jyotisha .	
4		4th Week	19,20		4. Itihasa (Ramayana and Mahabharata and Purana (Vishnupurana , Bhagavata Purana etc.) 5. Dharmashastra (Manusmriti , Yajnavalkya-smriti etc.) 6. Darshan. 7. Nyaya (Logic and Epistemology)	
5		5th Week	27	Unit 2: Modern science	1. Modern science: Introduction, Characteristics, importance and Example	
6	March	2nd Week	5,6		1. Modern science: Introduction, Characteristics, importance and Example 2. Difference between modern Science and Indian knowledge system	
7		3rd Week	12		3. Role of IKS in modern science	
8		3rd Week	13	Class Test- 1		
9		4th Week	19	Unit 2: Modern science	3. Role of IKS in modern science	
10		4th Week	20	Unit 3: Traditional Knowledge	1. Traditional knowledge: Definition, nature, characteristics, scope and importance	
11		5th Week	26,27		2. Indigenous Knowledge (IK): characteristics 3. Traditional knowledge vis-a-vis Indigenous	

12	April	1st Week	2,3	Unit 3: Traditional Knowledge	4. Traditional knowledge Vs western knowledge 5. The need for protecting traditional knowledge.	
13		2nd Week	9,10	Unit 4: Yoga and Holistic Health care	1. Yoga: Meaning and Importance of Yoga 2. Yoga and physical health, Yoga and psychological health, Yoga and intellectual health, Yoga and spiritual health, Yoga and social approach.	
14		3rd Week	16		3. Introduction to Ashtanga Yoga, Yogic Kriyas (Shat Karma)	
15		3rd week	17	Class test-II		
16		4th Week	23, 24	Unit 4: Yoga and Holistic Health care	4. Pranayama and its types; Active lifestyle and stress management through Yoga 5. Physical Fitness, Health and wellness: Meaning and Importance of Wellness	
17		5th Week	30		6. Components of Wellness, Health and physical Fitness	
18	May	1st Week	1		7. Traditional sports & Regional Games for promoting wellness 8. Leadership through Physical Activity and Sports; Introduction to First Aid.	
19		2nd Week	7,8	House Test		
20		3rd Week	14, 15	Unit 5: Himachal Pradesh: A Basic Information	1. History, Culture, Heritage/ Tradition, Customs & Manners	
21		4th Week	21,22		2. Regional Knowledge, Geographical Features, Constitutional History 3. Tourism Place & Scope	
22		5th Week	28		4. Festivals and Fairs	

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Govt. Polytechnic Talwar (H.P.)

Lesson Planning (Theory)

Branch : CIVIL ENGG Semester : 6TH

Subject :Entrepreneurship and start-ups Session : JAN- MAY 2025

Teacher: RANA KUNAL Class Room: A-201

S.No.	No. of Lectures	Chapter/ Unit Description	Detail of Contents	Reference Resources	Remarks
1	10	**Introduction to Entrepreneurship and Start–Ups**	Definitions, Traits of an entrepreneur, Intrapreneurship, Motivation. Types of Business Structures, Similarities/differences between entrepreneurs and managers.	R1	
2	9	**Business Ideas and their implementation**	Discovering ideas and visualizing the business Activity map Business Plan	R1	
3	11	**Idea to Start-up**	Market Analysis–Identifying the target market, Competition evaluation and Strategy Development, Marketing and accounting, Risk analysis	R1	
4	11	**Management**	Company's Organization Structure, Recruitment and management of talent. Financial organization and management	R1	
5	8	**Financing and Protection of Ideas**	Financing methods available for start-ups in India Communication of Ideas to potential investors–Investor Pitch	R1	
6	7	**Exit strategies for entrepreneurs**	Exit strategies for entrepreneurs, bankruptcy, and succession and harvesting strategy.	R1	

REFERENCE RESOURCES

R1- The Start up Owner's Manual: The Step-by-Step Guide for Building a Great Company. Steve Blank and Bob Dorf K & S Ranch

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Govt. Polytechnic Talwar (H.P.)

Lesson Planning (Theory)

Branch : CIVIL ENGG Semester : 6TH

Subject : Public Health Engineering Session : JAN- MAY 2025

Teacher: HARISH KUMAR Class Room: A-201

S.No.	No. of Lectures	Chapter/ Unit Description	Detail of Contents	Reference Resources	Remarks
1	9	**Sources, Demand and Quality of water**	Water supply schemes - Objectives, components, Sources of water: Surface and Subsurface sources of water, Intake Structures, Definition and types, Factors governing the location of an intake structure, Types of intakes. Demand of water: Factors affecting rate of demand, Variations of water demands, forecasting of population, Methods of forecasting of population, (Simple problems on forecasting of population), Design period, estimating of quantity of water supply required for city or town. Quality of water: Need for analysis of water, Characteristics of water- Physical, Chemical and Biological tests.	R1	
2	9	**Purification of water**	Purification of Water: Objectives of water treatment, Aeration- objects and methods of aeration, Plain sedimentation, Sedimentation with coagulation, principles of coagulation, types of coagulants, Jar Test, process of coagulation. Filtration - mechanization of filtration, classification of filters: slow sand filter, rapid sand filter, pressure filter. Construction and working of slow sand filter and rapid sand filter, operational problems in filtration. Disinfection: Objects, methods of disinfection, Chlorination Application of chlorine, forms of chlorination, types of chlorination practices, residual chlorine and its importance, Flow diagram of water treatment plants.	R1	
3	6	**Conveyance and Distribution of water**	Conveyance: Types of Pipes used for conveyance of water, choice of pipe material, Types of joints & Types of valves- their use, location and function on a pipeline. Distribution of water: Methods of distribution of water- Gravity, pumping, and combined system, Service reservoirs - functions and types, Layouts of distribution of Water-Dead end system, grid iron system, circular system, radial system; their suitability, advantages, and disadvantages.	R1	
4	9	**Domestic sewage and System of Sewerages**	Building Sanitation: Necessity of sanitation, Necessity to treat domestic sewage, Definitions - Sewage, Sullage, types of sewage. Definition of the terms related to Building Sanitation- Water pipe, Rainwater pipe, Soil pipe, Sullage pipe, Vent pipe. Systems of Sewerage and Sewer Appurtenances: Types of Sewers, Systems of sewerage, self- cleansing velocity and non-	R1	

			scouring velocity, Laying, Testing and maintenance of sewers, Manholes and Drop Manhole-component parts, location, spacing, construction details, Sewer Inlets, Street Inlets.		
5	**9**	**Characteristics and treatment of Sewage**	Analysis of sewage: Characteristics of sewage, B.O.D., C.O.D. and its significance. Central Pollution Control Board Norms for discharge of treated sewage, Objects of sewage treatment and flow diagram of conventional sewage treatment plant. Treatment of Sewage: Screening, Types of screens, Grit removal, Skimming, Sedimentation of sewage, Aerobic and anaerobic process, Sludge digestion, trickling filters, Activated sludge process, Disposal of sewage, Oxidation Pond, Oxidation ditch. Septic tank.	R1	

REFERENCE RESOURCES

R1- Sharma S.C, Environmental Engineering, Khanna Publishing House, New Delhi

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Govt. Polytechnic Talwar (H.P.)

Lesson Plan (Theory)

Branch : CIVIL ENGG — Semester: 6th

Subject : Design of Steel Structures — Session : JAN- MAY 2025

Teacher: NAVEEN BHARTI — Class Room: A-201

S.No.	No. of Lectures	Chapter/ Unit Description	Detail of Contents	Reference Resources	Remarks
1	5	**Structural Steel and Sections**	Terminology, Properties of structural steel as per IS Code, grades of steel, Designation of structural steel sections as per IS handbook and IS: 800. Classification of sections in Limit State Method.	R1	
2	10	**Bolted Connections (LSM)**	Types of Bolts (Theory only), Forces in Bolts, Types of Bolted joints with Sketches (Butt Joint and Lap Joint), Terminology & IS 800 Provisions for Gauge, Pitch, End & Edge Distance, Patterns of Bolting (Chain, Diamond, Staggered). Gross and net cross–sectional area of bolted members. Design of bolted connections & Efficiency of a joint. (Numerical problems on Ordinary Bolts only).	R1	
3	11	**Welded Connections (LSM)**	Introduction, advantages, and disadvantages of welded joint, defects in welds, Types of welds and their symbols. Terminology & IS 800 provisions for Size, Throat Thickness, End Returns etc. Longitudinal, Transverse & Intermittent welds. Design of fillet weld (Plate section, Single & Double Angle Section) and butt weld subjected to axial load. (Descriptive No numerical on plug and slot welds).	R1	
4	11	**Tension Members (LSM)**	Introduction to tension members, Types of section used in axial tension., Gross and net cross–sectional area of tension members (Numerical problems on Plate & Angles Sections only). Analysis & Design of tension member with welded and bolted connections (Plate, Single & Double Angle Sections only). Introduction to Lug Angle and Tension splice. (Theory only)	R1	
5	10	**Compression Members (LSM)**	Types of sections used, Effective length, Radius of gyration, slenderness ratio and its limit, Buckling Class, Effective length. Analysis and Design of axially loaded welded and bolted connections using tables and Equations of IS 800 (I-Section, Double Angle Section and Single angle section).	R1	
6	9	**Beams (LSM)**	Introduction, Different steel sections used, Simple and built-up sections, Plastic Hinge, Plastic section Modulus, Class of Section. Design of simple I section -Check for shear only (Low Shear & High Shear).	R1	

REFERENCE RESOURCES

- R1- Duggal, S. K., Limit State Design of Steel Structures, McGraw - Hill Publications,

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Govt. Polytechnic Talwar
Department of Civil Engineering
LESSON PLAN

Name of Teacher :- Parveen Kumari **Subject:** Technical Communication (OE) **Class:** 6th Semester

S. No.	Month	Week	Date	Name of Chapter	Contents to be taught	Remarks
1	January	5th week	28,29,30,31	Unit 1: Fundamentals of Technical Communication	1. Language as a tool of Communication 2. Features of Technical Communication	
2	February	1st week	4,5,6,7		3. Distinction between General and Technical Communication,Channels of Communication	
3		2nd week	11,13,14		4. Channels of Communication at workplace: Downward, Upward, Lateral or Horizontal, Diagonal, Grapevine, Consensus 5. Barriers to Communication and overcoming barriers	
4		3rd week	18,19,20,21		1. Types of Technical writing	1st Assignment
5		4th week	25,26,27,28		2. Drafting skills: Agenda and Minutes of Meetings, Official and Business Correspondence	
6	March	1st week	4,5,6,7	Unit 2. Technical Writing	3. Different formats of Report writing	
7		2nd week	11,12,13		4. Basics of Grammar: Spotting errors in sentences (Noun, Pronoun, Verb, Adverb, Adjective, Preposition, Conjunction, Article, Modals, Tenses, Punctuation)	2nd assignment
8		3rd week	18,19,20,21		5. Resume Writing and Covering letter	class test 1
9		4th week	25,26,27,28	Unit 3. Presentation Skills	1. Concept and Significance of Presentation skills	
10	April	1st week	1,2,3,4		2. Steps of a Effective Presentation	
11		2nd week	8,9,10,11		3. Elements of Effective Presentation skills, including public speaking Clarity of substance; Emotion, Humour, Overcoming Fear, Confident speaking, Audience Analysis and Retention of audience interest	
12		3rd week	16,17		4. How to improve Presentation Skills	2nd class test
13		4th week	22,23,24,25		1. What are Speaking Skills and Characteristics of a Good Speech 2. What is Panel Discussion and its procedure	
14		5th week	30'	Unit 4. Speaking skills	3. Job Interview Skills: What to do Before, After and During Interview	3rd Assignment
15	May	1st week	1,2		4. Body Language Examples and their Meanings-Positive and Negative. Body language for interviews	PTM
16		2nd week		House Test		
17		3rd week	13,14,15,16	Unit 4. Speaking skills	5 Difference between Etiquettes and Manners ,Table Etiquettes , Business Etiquettes, Telephone Etiquettes,	
18		4th week	20,21,22,23		5. Dressing Etiquettes and Workplace Etiquettes, How to get along with opposite Gender	
19		5th week	27,28		6. What are the elements of Voice	

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Signature of Teacher
PARVEEN KUMARI

Govt. Polytechnic Talwar
Department of Civil Engineering
LESSON PLAN

Name of Teacher :- Parveen Kumari **Subject:** Indian Constitution **Class:** 6th Semester

S. No.	Month	Week	Date	Name of Chapter	Contents to be taught	Remarks
1	January	5th week	27,28	Unit 1 Introduction to Constitution:	History of making of the Indian Constitution. Meaning and importance of the Constitution.	
2	February	1st week	3,4		Salient features and Preamble of Indian Constitution.	
3		2nd week	10,11		Fundamental rights- meaning and limitations. Directive principles of state policy and Fundamental duties -their enforcement and their relevance.	
4		3rd week	17,18	Unit 2 Union Government:	Structure of Union Government. Union Executive- President, Vice-president, Prime Minister, Council of Ministers.	1st Assignment
5		4th week	24,25		Union Legislature- Parliament and Parliamentary proceedings.	
6	March	1st week	3,4,		Union Judiciary-Supreme Court of India – composition and powers and function.	
7		2nd week	10,11	Unit 3 State and Local Governments:	Structure of State Government. state Executive- Governor, Chief Minister, Council of Ministers.	2nd assignment
8		3rd week	17,18		State Legislature-State Legislative	class test 1
9		4th week	24,25		Assembly and State Legislative Council.	
10	April	1st week	1,		State Judiciary-High court.	
11		2nd week	7,8		Local Government-Panchayat raj system with special reference to 73rd and Urban Local Self Govt. with special reference to74th Amendment.	
12		3rd week	21,22	Unit 4 Election provisions, Emergency provisions, Amendment of the constitution	Election Commission of India-composition, powers and functions and electoral process.	2nd class test
13		4th week	24,		Types of emergency-grounds,	
14		5th week	28,		procedure, duration and effects.	3rd Assignment
15	May	1st week	2,		Amendment of the constitution- meaning,	PTM
16		2nd week		House Test		
17		3rd week	13,19		Procedure and limitations.	
18		4th week	20,26,27		Revision	

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PARVEEN KUMARI

Govt. Polytechnic Talwar
Department of Civil Engineering
LESSON PLAN

Name of Teacher :- Nidhi Katoch **Subject:** Composites, Sciences & Technology (OE) **Class:** 6th Semester

S. No.	Month	Week	Date	Name of Chapter	Contents to be taught	Remarks
1	January	5th week	27,28,29,30	1. Introduction:	Definition – Classification and characteristics of Composite materials. terminology used in fiber science,	
2	February	1st week	3,4,5,6		Advantages and application of composites. Introduction to composite materials:	
3		2nd week	10,11,13		General characteristics of reinforcement-classification.	
4		3rd week	17,18,19,20	2 Polymer matrix composites:	Thermoplastic and thermosetting resins; Commonly used matrix reinforcement system;	1st Assignment
5		4th week	24,25,27		Fibre, Flake and particulate reinforced composites,	
6	March	1st week	3,4,5,6		Reinforcements used in PMC's glass, carbon, aramids, boron,	
7		2nd week	10,11,12,13		Roving's, yarns, fabrics, etc.; Thermoset matrices for aerospace components-polyesters,	2nd assignment
8		3rd week	17,18,19,20		epoxies, phenolics, vinyl esters, cyanate esters, etc.;	class test 1
9		4th week	24,25,26,27	3 Specialty composites:	Composites for satellites and advanced launch vehicles,	
10	April	1st week	1,2,3		Design considerations PMC for structural composites, Silicon carbide composites, design, processing and properties	
11		2nd week	7,8,9,10		Carbon-Carbon composites: Matrix precursors, Manufacturing considerations, Nanocomposites: Nano particle dispersion in polymer matrix,	
12		3rd week	16,17		Polymer- nanoclay composites and polymer-carbon nanotubes composites.	2nd class test
13		4th week	21,22,23,24	4 Manufacturing techniques:	Hand lay-up, Filament winding, Pultrusion, Resin transfer molding,	
14		5th week	28,30		Processing science of reactive polymer composites, Process steps for production, Selection of processing conditions toolings,	3rd Assignment
15	May	1st week	01.05.2025		Equipments, Carbon-carbon composites, Processing, Thermal and mechanical properties, Quality control.	PTM
16		2nd week		House Test		
17		3rd week	13,14,15	5 Testing of composites:	Raw material testing, Property evaluation at laminate level,	
18		4th week	19,20,21,22		NDT techniques.	
19		5th week	26,27,28		Revision	

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Lesson Planning (Practical)

Branch : CIVIL ENGG Semester : 6TH

Subject : Public Health Engineering Lab Session : JAN- MAY 2025

Teacher: HARISH KUMAR Class Room: A-201

S.No.	No. of Lectures	Chapter/ Unit Description	Detail of Contents	Reference Resources	Remarks
1	2	Practical No. 1	Determine pH value of given sample of water.	R1	
2	2	Practical No. 2	Determine the turbidity of the given sample of water.	R1	
3	2	Practical No. 3	Determine the turbidity of the given sample of water.	R1	
4	4	Practical No. 4	Determine suspended, dissolved solids and total solids of given sample of water.	R1	
5	4	Practical No. 5	Determine the dissolved oxygen in a sample of water	R1	
6	4	Practical No. 6	Determine the dissolved oxygen in a sample of water	R1	
7	4	Practical No. 7	Determine the optimum dose of coagulant in a given raw water sample by jar test.	R1	
8	2	Practical No. 8	Draw sketches of various valves used in water supply pipeline	R1	
9	2	Practical No. 9	Draw a sketch of one pipe and two pipe system of plumbing	R1	
10	2	Practical No. 10	Prepare a report of a field visit to sewage treatment plant	R1	

REFERENCE RESOURCES

R1 - • Sharma S.C, Environmental Engineering, Khanna Publishing House, New Delhi

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Govt. Polytechnic Talwar (H.P.)

Lesson Plan (Practical)

Branch : CIVIL ENGG | Semester: 6th

Subject : Design of Steel Structures Lab | Session: JAN- MAY 2025

Teacher: NAVEEN BHARTI | Class Room: A-201

S.No.	No. of Lectures	Chapter/ Unit Description	Detail of Contents	Reference Resources	Remarks
1	4	**Drawing No. 1**	Draw any five commonly used rolled steel sections and five built up sections.	R1	
2	8	**Drawing No. 2**	Details of splicing for steel columns of Same width Different widths	R1	
3	12	**Drawing No. 3**	Beam to beam connections Seated Connections Framed Connections	R1	
4	12	**Drawing No. 4**	Beam to column Seated Connections Framed Connections	R1	
5	10	**Drawing No. 5**	Column bases Slab base Gusseted base	R1	
6	10	**Drawing No. 6**	Steel roof truss with details of joints Heel Joint Ridge Joint	R1	

REFERENCE RESOURCES

- R1- Shah, V. L., and Gore, V., Limit State Design of Steel Structures, Structures Publications, Pune.

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