

Course Code: CEPE212 – (II)

Course Title: Railways, Bridges and Tunnels

Credits: 3 (L:3, T:0, P:0)

Course Category: PE

Duration: 26 January 2026 – May 2026

Total Teaching Hours: ~45 Hours

This plan is week-wise, clearly divided into Part I (Railways), Part II (Bridges), and Part III (Tunnels) and is suitable for Diploma / Undergraduate Civil Engineering programs.

### LESSON PLAN – RAILWAYS, BRIDGES AND TUNNELS (CEPE212-II)

Course Objectives (COs)

CO1: Understand railway terminology and surveys

CO2: Learn rail gauge, rails, sleepers, ballast, and track maintenance

CO3: Understand classification, components, and maintenance of bridges

CO4: Understand tunneling methods and tunnel components

#### WEEK-WISE TEACHING PLAN

##### PART – I: RAILWAYS

Week 1 (26 Jan – 31 Jan 2026)

Introduction to Indian Railways, Importance of railways in national development, Railway terminology

Teaching Method: Lecture + Discussion

CO Mapping: CO1

Week 2 (1 Feb – 7 Feb 2026)

Railway surveys, Factors influencing railway route, Types of railway surveys, Traffic survey, Reconnaissance survey, Preliminary survey, Location survey

Teaching Method: Lecture

CO Mapping: CO1

Week 3 (8 Feb – 14 Feb 2026)

Permanent way, Classification of permanent way, Components of permanent way, Teaching Method: Lecture + Diagrams

CO Mapping: CO2

Week 4 (15 Feb – 21 Feb 2026)

Rail gauge, Definition, Types, Practice in India, Rails, Types of rails

Teaching Method: Lecture

CO Mapping: CO2

Week 5 (22 Feb – 28 Feb 2026)

Rail fastening, Rail joints, Types of rail joints, Fish plates, Spikes, Bearing plates

Teaching Method: Lecture + Sketches

CO Mapping: CO2

Week 6 (1 Mar – 7 Mar 2026)

Sleepers, Functions, Types, Requirements of ideal sleeper material, Ballast, Functions, Requirements of ideal ballast material

Teaching Method: Lecture

CO Mapping: CO2

Week 7 (8 Mar – 14 Mar 2026)

Crossings and signaling, Types of crossings, Basic signaling systems, Track maintenance, Necessity, Track fixtures, Boxing of ballast, Maintenance gauges and tools, Teaching Method: Lecture

CO Mapping: CO2

Week 8 (15 Mar – 21 Mar 2026)

Track drainage, Methods of construction of drains, PART I Revision & Internal Test – I

CO Mapping: CO1, CO2

## PART – II: BRIDGES

Week 9 (22 Mar – 28 Mar 2026)

Introduction to bridges, Function of bridges, Components of bridges, Difference between bridge and culvert

Teaching Method: Lecture

CO Mapping: CO3

Week 10 (29 Mar – 4 Apr 2026)

Classification of bridges, According to life (permanent, temporary), According to deck level (deck, through, semi-through), According to materials, IRC classification, Teaching Method: Lecture + Charts

CO Mapping: CO3

Week 11 (5 Apr – 11 Apr 2026)

Bridge foundations, Open foundation, Pile foundation, Well foundation, Piers, Definition, Parts, Types (solid, open)

Teaching Method: Lecture + Diagrams

CO Mapping: CO3

Week 12 (12 Apr – 18 Apr 2026)

Abutments, Wing walls, Straight, Splayed, Return, Curved, Bridge bearings, Purpose, Types: fixed plate, rocker, roller

Teaching Method: Lecture

CO Mapping: CO3

Week 13 (19 Apr – 25 Apr 2026)

Maintenance of bridges, Inspection of bridges, Routine maintenance, PART II Revision & Internal Test – II

Teaching Method: Lecture + Discussion

CO Mapping: CO3

## PART – III: TUNNELS

Week 14 (26 Apr – 2 May 2026)

Definition and necessity of tunnels, Types of tunnels, Typical cross-sections, National highway tunnel

Single & double BG railway tunnel

Teaching Method: Lecture + Sketches

CO Mapping: CO4

Week 15 (3 May – 9 May 2026)

Ventilation of tunnels, Necessity, Methods, Blowing, Exhaust, Combination, Drainage in tunnels, Methods of draining water

Teaching Method: Lecture

CO Mapping: CO4

Week 16 (10 May – 16 May 2026)

Lighting in tunnels, Lining of tunnels, Materials used for lining, Teaching Method: Lecture

CO Mapping: CO4

Week 17 (17 May – End of Semester)

Overall revision of Railways, Bridges & Tunnels, Model question paper discussion, End semester examination preparation

#### ASSESSMENT PLAN

Internal Test – I: After Part I

Internal Test – II: After Part II

Assignments / Class tests

End Semester Examination



DEPARTMENT OF CIVIL ENGINEERING  
DR.B.R.AMBEDKAR GOVT.POLYTECHNIC AMBOTA,UNA(H.P)

LESSON PLAN FOR ADVANCED SURVEYING (SEMESTER- 4th) SESSION: (JAN. - MAY. , 2026)				
Sr. No.	MONTH	WEEK	CONTENTS	REMARKS
1	January	Week 5 (27 Jan. - 31 Jan.)	Plane Table Surveying: Principles of plane table survey, Accessories of plane table and their use, Telescopic alidade.	
2	February	Week 1 (2-Feb. - 7 Feb.)	Setting of plane table; Orientation of plane table - Back sighting and Magnetic meridian method. Methods of plane table surveys- Radiation, Intersection and Traversing.	
		Week 2 (9 Feb. - 13 Feb.)	Merits and demerits of plane table survey. <b>Theodolite Surveying:</b> Types and uses of Theodolite, Components of transit Theodolite and their functions, Reading the Vernier of transit Theodolite. Technical terms- Swinging, Transiting, Face left, Face right.	
		Week 3 (16 Feb. - 21 Feb.)	Fundamental axes of transit Theodolite and their relationship. Temporary adjustment of transit Theodolite. Measurement of horizontal angle- Direct and Repetition method, Errors eliminated by method of repetition.	
		Week 4 (23 Feb. - 28 Feb.)	Measurement of magnetic bearing of a line, Prolonging and ranging a line, deflection angle. Measurement of vertical Angle.	
3	March	Week 1 (2 Mar. - 7 Mar.)	Theodolite traversing by included angle method and Deflection angle method. Traverse Computation-Latitude, Departure, Consecutive coordinates, independent coordinates.	
		Week 2 (9 Mar. - 13 Mar.)	<b>Tacheometric surveying and Curve setting:</b> Principles of Tacheometry, Tacheometer, and its component parts, Anallatic lens.	CLASS TEST - I
		Week 3 (16 Mar. - 20 Mar.)	Tacheometric formula for horizontal distance with telescope horizontal and staff vertical. Field method for determining constants of tacheometer	
		Week 4 (23 Mar. - 28 Mar.)	determining horizontal and vertical distances with tacheometer by fixed hair method and staff held vertical, Limitations of tacheometry. Types of curves used in roads.	
		Week 5 (30 Mar. - 31 Mar.)	Designation of curves: Setting simple circular curve by offsets from long chord and Rankine's method of deflection angles.	
4	April	Week 1 (1 Apr. - 4 Apr.)	<b>Advanced surveying equipment:</b> Principle of Electronic Distance Meter (EDM), its component parts and their Functions, use of EDM.	
		Week 2 (6 Apr. - 10 Apr.)	Use of micro-optic Theodolite and Electronic Digital Theodolite. Use of Total Station, Use of function keys.	CLASS TEST - II
		Week 3 (13 Apr. - 18 Apr.)	<b>Remote sensing, GPS and GIS:</b> Remote Sensing – Overview, Remote sensing system, Applications of remote sensing in Civil engineering	
		Week 4 (20 Apr. - 25 Apr.)	Applications of remote sensing in Civil engineering, land use / Land cover, mapping, disaster management. Use of Global Positioning System (G.P.S.) instruments.	
		Week 5 (27 Apr. - 30 Apr.)	Geographic Information System (GIS): Overview, Components, Applications, Software for GIS.	
5	May	Week 1 (2 May. - 8 May.)	Introduction to Drone Surveying.	
		Week 2 (11 May. - 16 May.)	<b>HOUSE TEST</b>	
		Week 3 (18 May. - 23 May.)	Revision	
		Week 4 (25 May. - 27 May.)	Revision	

  
Signature of Faculty  
(Er. Manoj Kumar)

  
Signature of H.O.D.  
(Er. Chetan Mandela)

Monthly Review by HOD :

Sr. No.	Review for the month of	Date	Comments by HOD	Remarks
1	February			
2	March			
3	April			
4	May			

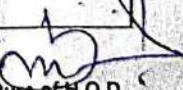
4th Sem

DEPARTMENT OF CIVIL ENGINEERING  
DR.B.R.AMBEDKAR GOVT.POLYTECHNIC AMBOTA,UNA(H.P)

LESSON PLAN FOR ADVANCED SURVEYING LAB G-II (SEMESTER- 4th)SESSION: (JAN. - MAY. , 2026)

Sr. No.	MONTH	WEEK	CONTENTS	REMARKS
1	January	Week 5 (27 Jan. - 31 Jan.)	Introduction and familiarization with lab and equipments	
2	Februry	Week 1 (2 Feb. - 7 Feb.)	Use plane table survey to prepare plans of a plot of seven-sided closed traverse by Radiation Method.	
		Week 2 (9 Feb. - 13 Feb.)	Use plane table survey to prepare plans, locate details by Intersection Method. Checking of files & viva.	
		Week 3 (16 Feb. - 21 Feb.)	Use plane table survey to prepare plans, locate details by Traversing Method. Checking of files & viva.	
		Week 4 (23 Feb. - 28 Feb.)	Use plane table survey to carry out Survey Project for closed traverse for minimum five sides around a building. Checking of files & viva.	
3	March	Week 1 (2 Mar. - 7 Mar.)	Use transit theodolite to measure Horizontal and Vertical angle by Direct Method. Checking of files & viva.	
		Week 2 (9 Mar. - 13 Mar.)	Plot the traverse on A1 size imperial drawing sheet for the collected data from preceding Theodolite Survey Project. Checking of files & viva.	
		Week 3 (16 Mar. - 20 Mar.)	Use Theodolite as a Tacheometer to compute reduced levels and horizontal distances. Checking of files & viva.	
		Week 4 (23 Mar. - 28 Mar.)	Set out a circular curve by Rankine's Method of Deflection Angles. Checking of files & viva.	
		Week 5 (30 Mar. - 31 Mar.)	Set out a circular curve by Rankine's Method of Deflection Angles. Checking of files & viva.	
4	April	Week 1 (1 Apr. - 4 Apr.)	Use micro-optic Theodolite to Measure Horizontal angle by Direct Method. Checking of files & viva.	
		Week 2 (6 Apr. - 10 Apr.)	Use EDM to measure horizontal distance. Checking of files & viva.	
		Week 3 (13 Apr. - 18 Apr.)	Use Total station instrument to measure horizontal distances. Checking of files & viva.	
		Week 4 (20 Apr. - 25 Apr.)	Use Total station instrument to measure vertical angle. Checking of files & viva.	
		Week 5 (27 Apr. - 30 Apr.)	Use Total station instrument to carry out Survey Project for closed traverse for minimum five sides. Checking of files & viva.	
4	May	Week 1 (2 May. - 8 May.)	Plot the traverse on A1 size imperial drawing sheet for the collected data from preceding Total Station Survey Project. Checking of files & viva.	
		Week 2 (11 May. - 16 May.)	HOUSE TEST	
		Week 3 (18 May. - 23 May.)	Use GPS to locate the coordinates of a station. Checking of files & viva.	
		Week 4 (25 May. - 27 May.)	Checking of files and Viva.	

  
Signature of Faculty  
(Er. Manoj Kumar)

  
Signature of H.O.D  
(Er. Chetan Mandela)

Monthly Review by HOD :

Sr. No.	Review for the month of	Date	Comments by HOD	Remarks
1	Februry			
2	March			
3	April			
4	May			

4th Sem

DEPARTMENT OF CIVIL ENGINEERING  
DR.B.R.AMBEDKAR GOVT.POLYTECHNIC AMBOTA,UNA(H.P)

LESSON PLAN FOR ADVANCED SURVEYING LAB G-I (SEMESTER- 4th)SESSION: (JAN. - MAY. , 2026)

Sr. No.	MONTH	WEEK	CONTENTS	REMARKS	
1	January	Week 5 (27 Jan. - 31 Jan.)	Introduction and familiarization with lab and equipments		
		Week 1 (2 Feb. - 7 Feb.)	Use plane table survey to prepare plans of a plot of seven-sided closed traverse by Radiation Method.		
		Week 2 (9 Feb. - 13 Feb.)	Use plane table survey to prepare plans, locate details by Intersection Method. Checking of files & viva.		
2	Februry	Week 3 (16 Feb. - 21 Feb.)	Use plane table survey to prepare plans, locate details by Traversing Method. Checking of files & viva.		
		Week 4 (23 Feb. - 28 Feb.)	Use plane table survey to carry out Survey Project for closed traverse for minimum five sides around a building. Checking of files & viva.		
3		Week 1 (2 Mar. - 7 Mar.)	Use transit theodolite to measure Horizontal and Vertical angle by Direct Method. Checking of files & viva.		
		Week 2 (9 Mar. - 13 Mar.)	Plot the traverse on A1 size imperial drawing sheet for the collected data from preceding Theodolite Survey Project. Checking of files & viva.		
		Week 3 (16 Mar. - 20 Mar.)	Use Theodolite as a Tacheometer to compute reduced levels and horizontal distances. Checking of files & viva.		
		Week 4 (23 Mar. - 28 Mar.)	Set out a circular curve by Rankine's Method of Deflection Angles. Checking of files & viva.		
		Week 5 (30 Mar. - 31 Mar.)	Set out a circular curve by Rankine's Method of Deflection Angles. Checking of files & viva.		
4	April	Week 1 (1 Apr. - 4 Apr.)	Use micro-optic Theodolite to Measure Horizontal angle by Direct Method. Checking of files & viva.		
		Week 2 (6 Apr. - 10 Apr.)	Use EDM to measure horizontal distance. Checking of files & viva.		
		Week 3 (13 Apr. - 18 Apr.)	Use Total station instrument to measure horizontal distances. Checking of files & viva.		
		Week 4 (20 Apr. - 25 Apr.)	Use Total station instrument to measure vertical angle. Checking of files & viva.		
		Week 5 (27 Apr. - 30 Apr.)	Use Total station instrument to carry out Survey Project for closed traverse for minimum five sides. Checking of files & viva.		
4	May	Week 1 (2 May. - 8 May.)	Plot the traverse on A1 size imperial drawing sheet for the collected data from preceding Total Station Survey Project. Checking of files & viva.		
		Week 2 (11 May. - 16 May.)	HOUSE TEST		
		Week 3 (18 May. - 23 May.)	Use GPS to locate the coordinates of a station. Checking of files & viva.		
		Week 4 (25 May. - 27 May.)	Checking of files and Viva		

Signature of Teacher  
(Er. Manoj Kumar)

Signature of H.O.D  
(Er. Chetan Mandela)

Monthly Review by HOD :

Sr. No.	Review for the month of	Date	Comments by HOD	Remarks
1	Februry			
2	March			
3	April			
4	May			

4th Sem

**Dr. B.R. Ambedkar Govt. Polytechnic, Ambota Una (H.P.)**

**Department of Civil Engineering**

**LESSON PLAN**

Program Name	Diploma in Civil Engineering								
Course/Subject Name	Building Planning & Drawing (Theory)								
Course/Subject Code	N-2022 / CEPC206								
Course/Subject Co-ordinator Name	Amandeep Singh								

**Evaluation Scheme**

Sr. No.	Subject Name	Study Scheme			Evaluation Scheme					Total Marks (Int. & Ext.)			
		L	BS	Total	Internal Assessment			External Assessment					
1	Building Planning & Drawing	1	0	1 Hr./week	Th.	Pr.	T	Th.	Hrs.	100			
					40	-	40	60	3				
Reference Books		Swamy, Kumara; Rao, N, Kameshwara, A., Building Planning and Drawing, Charotar Publication,											
		Shah. M.G. Kale, CM, Patki, S.Y., Building Drawing, McGraw Hill Publishing											
		Malik and Mayo, Civil Engineering Drawing, Computech Publication Ltd											

**Teaching Plan**

Unit No.	Name of Topic	Proposed Week	Actual Date	Remarks
1	Conventions as per IS 962, symbols for different materials such as earthwork, brickwork, stonework, concrete, woodwork, and glass. Graphical symbols for doors and windows, Abbreviations, symbols for sanitary and electrical installations. 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 <sup>st</sup> Week (27/01/2026-01/02/2026)		
1	Types of scale- Monumental, Intimate, criteria for Proper Selection of scale for various types of drawing. Sizes of various standard papers/sheets. Reading and interpreting readymade Architectural building drawing (To be procured from Architect, Planning Consultants, Planning Engineer).	2 <sup>nd</sup> Week (03/02/2026-09/02/2026)	1 <sup>st</sup> Week 40 Hrs. 3 60	Total Marks (Int. & Ext.) 100
2	Principles of planning for Residential and Public building- Aspect, Prospect, Orientation, Grouping, Privacy, Elegance, Flexibility, Circulation, Furniture requirements, Sanitation, Economy, Space requirement and norms for minimum dimension of different units in the residential and public buildings as per IS 962. Rules and byelaws of sanctioning authorities for construction work.	3 <sup>rd</sup> Week (10/02/2026-17/02/2026)		
2	Plot area built up area, super built-up area, plinth area, carpet area, floor area and FAR (Floor Area Ratio). 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.	4 <sup>th</sup> Week (18/02/2026-24/02/2026)		
3	Drawing of Single storey Load Bearing residential building (2 BHK) with staircase.	5 <sup>th</sup> Week (25/02/2026-03/03/2026)		
3	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.	6 <sup>th</sup> Week (03/03/2026-11/03/2026)		
3	Working drawing – developed plan, elevation, section passing through staircase or WC and bath.	7 <sup>th</sup> Week (12/03/2026-19/03/2026)		
3	Foundation plan of Load bearing structure.	8 <sup>th</sup> Week (20/03/2026-28/03/2026)		
4	Drawing of Two storeyed Framed Structure (G+1), residential	9 <sup>th</sup> Week (29/03/2026-13/04/2026)		

	building (2 BHK) with stair- case	(30/03/2026-06/04/2026)		
4	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.	10 <sup>th</sup> Week (07/04/2026-16/04/2026)		
4	Working drawing of Framed Structure – developed plan, elevation, section passing through staircase or WC and bath.	11 <sup>th</sup> Week (17/04/2026-23/04/2026)		
4	Foundation plan of Framed Structure.	12 <sup>th</sup> Week (24/04/2026-30/04/2026)		
4	Details of RCC footing, Column, Beam, Chajjas, Lintel, Staircase, and slab.	13 <sup>th</sup> Week (02/05/2026-08/05/2026)		
4	Drawing with CAD- Draw commands, modify commands, layer commands.	14 <sup>th</sup> Week (11/05/2026-16/05/2026)		
4	Drawing with CAD- Draw commands, modify commands, layer commands.	15 <sup>th</sup> Week (18/05/2026-23/05/2026)		
	Revision	16 <sup>th</sup> Week (25/05/2026-26/05/2026)		

#### House Test/Class Test

Name of Test	Contents of Syllabus Covered	Proposed Week	Actual Date	Remarks
Class Test 1	Unit 1- Conventions & Symbols, Unit 2- Planning of Building.	2 <sup>nd</sup> Week of March 2026		
Class Test 2	Unit 3- Drawing of Load Bearing Structure , Unit 4- Drawing of Framed Structure	2 <sup>nd</sup> Week of April 2026		
House Test	Unit 1- Conventions & Symbols, Unit 2- Planning of Building, Unit 3- Drawing of Load Bearing Structure , Unit 4- Drawing of Framed Structure	2 <sup>nd</sup> Week of May 2026		

Signature of HOD

Signature of Teacher

Proposed Week	Actual Date	Remarks
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26		
27		
28		
29		
30		
31		

4th Semester

**Dr. B.R. Ambedkar Govt. Polytechnic, Ambota Una (H.P.)**  
**Department of Civil Engineering**

**LESSON PLAN**

Program Name	Diploma in Civil Engineering	
Course/Subject Name	Building Planning & Drawing Lab.	
Course/Subject Code	N-2022 / CEPC218	
Course/Subject Co-ordinator Name	Amandeep Singh	

**Evaluation Scheme**

Sr. No.	Subject Name	Study Scheme			Evaluation Scheme					Total Marks (Int. & Ext.)
		P	BS	Total	Internal Assessment		External Assessment			
1	Building Planning & Drawing Lab.	4	0	4 Hrs./week	Th.	Pr.	T	Pr.	Hrs.	T
					-	40	40	60	3	60
										100
	Reference Books				Swamy, Kumara; Rao, N, Kameshwara, A., Building Planning and Drawing, Charotar Publication,					
					Shah. M.G. Kale, CM, Patki, S.Y., Building Drawing, McGraw Hill Publishing					
					Malik and Mayo, Civil Engineering Drawing, Computech Publication Ltd					

**Lab. / Drawing Plan**

Drawing No.	Name of Topic	Proposed Week	Actual Date	Remarks
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.	1 <sup>st</sup> Week (27/01/2026-02/02/2026)		
2	Draw line plan to suitable scale (1BHK, staircase, WC and Bathroom)	2 <sup>nd</sup> Week (03/02/2026-09/02/2026)		
3	Draw line plans to suitable scale for the following Public Buildings (School Building and Community Hall).	3 <sup>rd</sup> Week (10/02/2026-17/02/2026)		Total Marks (Int. & Ext.)
3	Draw line plans to suitable scale for the following Public Buildings (School Building and Community Hall).	4 <sup>th</sup> Week (18/02/2026-24/02/2026)	50	100
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	5 <sup>th</sup> Week (25/02/2026-03/03/2026)		
4	Draw submission drawing to the scale 1:100 of a single storey load bearing residential building (2BHK) with flat Roof and staircase showing c. Foundation plan and schedule of openings. d. Site plan (1:200), area statement, construction notes.	1 <sup>st</sup> Week (04/03/2026-10/03/2026)		
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	3 <sup>rd</sup> Week (12/03/2026-19/03/2026) 4 <sup>th</sup> Week (18/03/2026-25/03/2026)	60	100
5	Draw submission drawing, to the scale of 1:100, of (G+1) Framed Structure Residential Building (2BHK) with Flat Roof and staircase showing: d. Site plan (1:200) and area statement e. Schedule of openings and Construction Notes.	8 <sup>th</sup> Week (20/03/2026-28/03/2026) 9 <sup>th</sup> Week (31/03/2026-07/04/2026)		
6	Draw working drawing for above mentioned drawing at serial	9 <sup>th</sup> Week		

4th Sem

**Dr. B.R. Ambedkar Govt. Polytechnic, Ambota Una (H.P.)**

**Department of Civil Engineering**

**LESSON PLAN**

Program Name	Diploma in Civil Engineering	
Course/Subject Name	Hydraulics Lab.	
Course/Subject Code	N-2022 / CEPC214	
Course/Subject Co-ordinator Name	Amandeep Singh	

**Evaluation Scheme**

Sr. No.	Subject Name	Study Scheme			Evaluation Scheme						Total Marks (Int. & Ext.)
		P	BS	Total	Internal Assessment			External Assessment			
1	Hydraulics Lab.	2	-	2 Hrs./week	Th.	Pr.	T	Pt.	Hrs.	T	100
S.S. Rattan, Fluid Mechanics and Hydraulic Machines, Khanna Publishing House, Delhi											
Rajput, R K, Fluid Mechanics, S Chand, New Delhi											

**Lab. Plan**

Unit No.	Name of Topic	Proposed Week	Actual Date	Remarks
1	Use piezometer to measure pressure at a given point.	1 <sup>st</sup> Week (27/01/2026- 02/02/2026)	G1- G2-	
2	Use U tube differential manometer to measure pressure difference between two given points.	2 <sup>nd</sup> Week (03/02/2026- 09/02/2026)	G1- G2-	
3	Find the resultant pressure and its position for given situation of liquid in a tank.	3 <sup>rd</sup> Week (10/02/2026- 17/02/2026)	G1- G2-	
4	Use Reynold's apparatus to determine type of flow.	4 <sup>th</sup> Week (18/02/2026- 24/02/2026)	G1- G2-	
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.	5 <sup>th</sup> Week (25/02/2026- 03/03/2026)	G1- G2-	100
6	Determine minor losses in pipe fittings due to sudden contraction and sudden enlargement.	6 <sup>th</sup> Week (05/03/2026- 11/03/2026)	G1- G2-	
7	Determine minor losses in pipe fitting due to Bend and Elbow.	7 <sup>th</sup> Week (12/03/2026- 19/03/2026)	G1- G2-	
8	Calibrate Venturimeter to find out the discharge in a pipe.	8 <sup>th</sup> Week (20/03/2026- 28/03/2026)	G1- G2-	
9	Calibrate the Orifice to find out the discharge through a tank	9 <sup>th</sup> Week (30/03/2026- 06/04/2026)	G1- G2-	
10	Use Current meter to measure the velocity of flow of water in open channel.	10 <sup>th</sup> Week (07/04/2026- 16/04/2026)	G1- G2-	
11	Use Pitot tube to measure the velocity of flow of water in open channel.	11 <sup>th</sup> Week (17/04/2026- 23/04/2026)	G1- G2-	
12	Use triangular notch to measure the discharge through open channel.	12 <sup>th</sup> Week (24/04/2026- 30/04/2026)	G1- G2-	
13	Use Rectangular notch to measure the discharge through open channel	13 <sup>th</sup> Week (02/05/2026- 08/05/2026)	G1- G2-	

Signature of HOD

Signature of Teacher

**Dr. B.R. Ambedkar Govt. Polytechnic, Ambot Una (H.P.)**

**Department of Civil Engineering**

**LESSON PLAN**

Program Name	Diploma in Civil Engineering	
Course/Subject Name	Hydraulics	
Course/Subject Code	N-2022 / CEPC202	
Course/Subject Co-ordinator Name	Amandeep Singh	

**Evaluation Scheme**

Sr. No.	Subject Name	Study Scheme			Evaluation Scheme				Total Marks (Int. & Ext.)		
		L	BS	Total	Internal Assessment			External Assessment			
1	Hydraulics	2	2	4 Hrs./week	Th.	Pr.	T	Th.	Hrs.	T	100
Reference Books	Modi, P. N. and Seth, S.M., Hydraulics and Fluid Mechanics, Standard book house, Delhi.										
	Khurmi R S, Hydraulics, Fluid Mechanics, Hydraulic machines, S. Chand Publishers										
	Rajput, R K, Fluid Mechanics, S Chand, New Delhi.										

**Teaching Plan**

Unit No.	Name of Topic	Proposed Week	Actual Date	Remarks
1	Technical terms used in Hydraulics –fluid, fluid mechanics, hydraulics, hydrostatics, and hydrodynamics - ideal and real fluid, application of hydraulics	1 <sup>st</sup> Week (27/01/2026- 02/02/2026)		
1	Physical properties of fluid – density-specific volume, specific gravity, surface tension, capillarity, and viscosity-Newton's law of viscosity.	1 <sup>st</sup> Week (27/01/2026- 02/02/2026)		
1	Various types of pressure – Atmospheric Pressure, Gauge Pressure, Absolute Pressure, Vacuum Pressure.	2 <sup>nd</sup> Week (03/02/2026- 09/02/2026)		
1	Concept of Pressure head and its unit, Pascal's law of fluid pressure and its uses, Measurement of differential Pressure by different methods.	2 <sup>nd</sup> Week (03/02/2026- 09/02/2026)		
1	Variation of pressure with depth, Pressure diagram, hydrostatic pressure and center of pressure on immersed surfaces and on tank walls.	3 <sup>rd</sup> Week (10/02/2026- 17/02/2026)		
1	Determination of total pressure and center of pressure on sides and bottom of water tanks, sides and bottom of tanks containing two liquids,	4 <sup>th</sup> Week (18/02/2026- 24/02/2026)		
1	Vertical surface in contact with liquid on either side	4 <sup>th</sup> Week (18/02/2026- 24/02/2026)		
2	Types of flow – Gravity and pressure flow, Laminar, Turbulent, Uniform, Non-uniform, Steady, Unsteady flow. Reynolds number	5 <sup>th</sup> Week (25/02/2026- 03/03/2026)		
2	Discharge and its unit, continuity equation of flow.	5 <sup>th</sup> Week (25/02/2026- 03/03/2026)		
2	Energy of flowing liquid: potential, kinetic and pressure energy.	6 <sup>th</sup> Week (05/03/2026- 11/03/2026)		
2	Bernoulli's theorem: statement, assumptions, equation.	6 <sup>th</sup> Week (05/03/2026- 11/03/2026)		
3	Major Head loss in pipe: Frictional loss and its computation by Darcy's Welsbach equation.	7 <sup>th</sup> Week (12/03/2026- 19/03/2026)		

## Lesson Plan

Course Code: CEPC208

Course Title: Transportation Engineering

Credits: 3 (L:3, T:0, P:0)

Course Category: PCC

Duration: 26 January 2026 – May 2026

Total Teaching Hours: ~45 Hours

This plan is week-wise, aligned with IRC recommendations, and suitable for Polytechnic / Undergraduate Civil Engineering programs.

### LESSON PLAN – TRANSPORTATION ENGINEERING (CEPC208)

#### Course Objectives (COs)

CO1: Identify types and classification of roads as per IRC

CO2: Understand geometric design elements of highways

CO3: Perform and understand tests on road materials

CO4: Identify components, construction, and maintenance of railway tracks

#### WEEK-WISE TEACHING PLAN

##### UNIT – I: OVERVIEW OF HIGHWAY ENGINEERING

Week 1 (26 Jan – 31 Jan 2026)

Introduction to Transportation Engineering

Role of transportation in national development

Scope and importance of roads in India

Characteristics of road transport

Teaching Method: Lecture + Discussion

CO Mapping: CO1

Week 2 (1 Feb – 7 Feb 2026)

Modes of transportation

Roadways, Railways, Waterways, Airways, Merits & demerits of roadway and railway transport

Teaching Method: Lecture + Comparative tables

CO Mapping: CO1

Week 3 (8 Feb – 14 Feb 2026)

General classification of roads

Based on location & function (NH, SH, MDR, ODR, VR), IRC classification, Road patterns

Teaching Method: Lecture + Charts

CO Mapping: CO1

Week 4 (15 Feb – 21 Feb 2026)

Road alignment, Factors affecting road alignment, Engineering, traffic, and economic considerations

Unit I Revision & Internal Test – I

CO Mapping: CO1

##### UNIT – II: GEOMETRIC DESIGN OF HIGHWAY

Week 5 (22 Feb – 28 Feb 2026)

**Lesson Plan / Teaching Plan for  
Course Code: CEPE210-(I) – Construction Management**

**Duration: 26 January 2026 to May 2026**

**Credits: 3 (L:3, T:0, P:0)**

**Total Teaching Hours: ~40–45 hours (Typical semester)**

**The plan is structured week-wise, aligned with Units I–V, and suitable for polytechnic / undergraduate engineering programs.**

**LESSON PLAN**

**Course Title: Construction Management**

**Course Objectives Mapping**

**CO1: Understand construction organization and contract management**

**CO2: Understand principles of site layout**

**CO3: Learn planning and scheduling techniques**

**CO4: Understand contracts, arbitration, labour laws**

**CO5: Understand safety practices in construction projects**

**WEEK-WISE TEACHING PLAN**

**(3 Lectures per week x approx. 15 weeks)**

**Week 1 (26 Jan – 31 Jan 2026)**

**Unit I: Construction Industry and Management**

**Introduction to Construction Industry**

**Scope and importance of Construction Management**

**Objectives and principles of organization**

**Teaching Method: Lecture + Discussion**

**CO Mapping: CO1**

**Week 2 (1 Feb – 7 Feb 2026)**

**Types of organizations in construction**

**Government / Public sector**

**Private sector**

**Comparison of public vs private construction organizations**

**Teaching Method: Lecture + Examples**

**CO Mapping: CO1**

**Week 3 (8 Feb – 14 Feb 2026)**

**Role of various personnel in construction organization**

**Owner**

**Engineer**

**Supervisor**

**Contractor**

**Hierarchy in construction organization**

**Teaching Method: Lecture + Case Study**

**CO Mapping: CO1**

**Week 4 (15 Feb – 21 Feb 2026)**

**Agencies associated with construction work**