

TEACHING-CUM-LESSON PLAN

- 1) Subject Code Th-1
- 2) Subject Title: Structural Design - I
- 3) Semester: 4th
- 4) Branch: Civil engg
- 5) No. of Classes / Week: 6
- 6) Pre Requisite for the Subject: NIL / YES, If YES, give details:
 - i) Basic knowledge about strength of material course.
 - ii) Basic knowledge about civil engineering material and construction.
- 7) Text Book to be referred by students:

Sl No.	Book	Author	Publication	Year (Edition)	Whether available in Library
i	Limit State Method (RCC Design)	A.K. Jain.	Nem Chand & Bros	7th	YES
ii	Reinforced Concrete	H.J Saha.	Charotar Publishing house	2nd	YES

8) Course Coverage Schedule:

Sl No.	Week No.	Ch. No	No. of classes planed	Topic to be covered	Article		Expected Date of Completion	Remark
					From	To		
i	1	1	5	Working stress method (WSM)	1.1	1.5, 1001	20.03.22	
		2	1	Philosophy of Limit state method (LSM)	2.1	2.1		
ii	2	2	2	Philosophy of Limit state method (LSM)	2.2	2.3, 1002	28.03.22	
		3	4	Analysis and design of singly and double reinforced sections (LSM)	3.1	3.2		
iii	3	3	6	Analysis and design of singly and double reinforced sections (LSM)	3.3	3.4, 1003	11.04.22	
iv	4	4	5	Shear, Bond and Development Length (LSM)	4.1	4.3, 1004	19.04.22	
		5	1	Analysis and Design of T-Beam (LSM)	5.1	5.1		

v	5	5	6	Analysis and Design of T-Beam (LSM)	5.2	5.3		
vi	6	5	3	Analysis and Design of T-Beam (LSM)	5.3	5.3,1005	30.04.22	
		6	3	Analysis and Design of Slab and Stair case (LSM)	6.1	6.2		
vii	7	6	6	Analysis and Design of Slab and Stair case (LSM)	6.2	6.4		
viii	8	6	3	Analysis and Design of Slab and Stair case (LSM)	6.5	6.5,1006	13.05.22	
		7	3	Design of Axially loaded columns and Footings (LSM)	7.1	7.1		
ix	9	7	6	Design of Axially loaded columns and Footings (LSM)	7.2	7.3		
x	10	7	6	Design of Axially loaded columns and Footings (LSM)	7.3	7.4,1007	03.06.22	
Total:		7	60					

9) **Detail Class wise Plan :**

Detailed Topic Plan:

Chapter No: 1 Chapter Name: Working stress method (WSM)

1.1 Objectives of design and detailing. State the different methods of design of concrete structures.
 1.2 Introduction to reinforced concrete, R.C. sections their behavior, grades of concrete and steel. Permissible stresses, assumption in W.S.M. 1.3 Flexural design and analysis of single reinforced sections from first principles. 1.4 Concept of under reinforced, over reinforced and balanced sections. 1.5 Advantages and disadvantages of WSM, reasons for its obsolescence.

Sl No.	Week No.	Lecture No.	Topic to be Covered	Article No.	Date of Completion	Signature
1	1	1	Objectives of design and detailing. State the different methods of design of concrete structures assumption in W.S.M.	1.1		
2		2	Introduction to reinforced concrete, R.C. sections their behavior, grades of concrete and steel. Permissible stresses,	1.2		
3		3	Flexural design and analysis of single reinforced sections from first principles	1.3		

4		4	Concept of under reinforced, over reinforced and balanced sections. Advantages and disadvantages of WSM, reasons for its obsolescence.	1.4 1.5		
5		5	Doubt clear and revision of topics	1001		
REVIEW						

Detailed Topic Plan:

Chapter No: 2 Chapter Name: Philosophy Of Limit State Method (LSM)

2.1 Definition, Advantages of LSM over WSM, IS code suggestions regarding design philosophy.
2.2 Types of limit states, partial safety factors for materials strength, characteristic strength, characteristic load, design load, loading on structure as per I.S. 875 2.3 Study of I.S specification regarding spacing of reinforcement in slab, cover to reinforcement in slab, beam column & footing, minimum reinforcement in slab, beam & column, lapping, anchorage, effective span for beam & slab.

Sl No.	Week No.	Lecture No.	Topic to be Covered	Article No.	Date of Completion	Signature
1	1	6	Definition, Advantages of LSM over WSM, IS code suggestions regarding design philosophy. Types of limit states, partial safety factors for materials strength, characteristic strength, characteristic load, design load, loading on structure as per I.S. 875	2.1 2.2		
2	2	7	Study of I.S specification regarding spacing of reinforcement in slab, cover to reinforcement in slab, beam column & footing, minimum reinforcement in slab, beam & column, lapping, anchorage, effective span for beam & slab.	2.3		
3		8	Doubt clear and revision of topics	1002		

REVIEW

Detailed Topic Plan:

Chapter No: 3 Chapter Name: Analysis and Design of Single and Double Reinforced Sections (LSM reinforced rectangular section)

3.1 Limit state of collapse (flexure), Assumptions, Stress-Strain relationship for concrete and steel, neutral axis, stress block diagram and strain diagram for singly reinforced section. 3.2 Concept of under- reinforced, over-reinforced and limiting section, neutral axis co-efficient, limiting value of moment of resistance and limiting percentage of steel required for limiting singly R.C. section. 3.3 Analysis and design: determination of design constants, moment of resistance and area of steel for rectangular sections 3.4 Necessity of doubly reinforced section, design of doubly.

Sl No.	Week No.	Lecture No.	Topic to be Covered	Article No.	Date of Completion	Signature
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1	2	9	Limit state of collapse (flexure), Assumptions, Stress-Strain relationship for concrete and steel, neutral axis, stress block diagram and strain diagram for singly reinforced section.	3.1		
2		10	Limit state of collapse (flexure), Assumptions, Stress-Strain relationship for concrete and steel, neutral axis, stress block diagram and strain diagram for singly reinforced section.	3.1		
3		11	Concept of under- reinforced, over-reinforced and limiting section, neutral axis co-efficient, limiting value of moment of resistance and limiting percentage of steel required for limiting singly R.C. section.	3.2		
4		12	Concept of under- reinforced, over-reinforced and limiting section, neutral axis co-efficient, limiting value of moment of resistance and limiting percentage of steel required for limiting singly R.C. section.	3.2		
5	3	13	Concept of under- reinforced, over-reinforced and limiting section, neutral axis co-efficient, limiting value of moment of resistance and limiting percentage of steel required for limiting singly R.C. section.	3.2		
6		14	Concept of under- reinforced, over-reinforced and limiting section, neutral axis co-efficient, limiting value of moment of resistance and limiting percentage of steel required for limiting singly R.C. section.	3.2		
7		15	Analysis and design: determination of design constants, moment of resistance and area of steel for rectangular sections 3.4 Necessity of doubly reinforced section, design of doubly	3.3		
8		16	Analysis and design: determination of design constants, moment of resistance and area of steel for rectangular sections 3.4 Necessity of doubly reinforced section, design of doubly	3.3		
9		17	Analysis and design: determination of design constants, moment of resistance and area of steel for rectangular sections 3.4 Necessity of doubly reinforced section, design of doubly	3.3		
10		18	Doubt clear and revision of topics	1003		
REVIEW						

Detailed Topic Plan:**Chapter No: 4 Chapter Name: Shear, Bond and Development Length (LSM)**

4.1 Nominal shear stress in R.C. section, design shear strength of concrete, maximum shear stress, design of shear reinforcement, minimum shear reinforcement, forms of shear reinforcement. 4.2 Bond and types of bond, bond stress, check for bond stress, development length in tension and compression, anchorage value for hooks 90° bend and 45° bend standards lapping of bars, check for development length. 4.3 Numerical problems on deciding whether shear reinforcement is required or not, check for adequacy of the section in shear. Design of shear reinforcement; Minimum shear reinforcement in beams (Explain through examples only).

Sl No.	Week No.	Lecture No.	Topic to be Covered	Article No.	Date of Completion	Signature
1	4	19	Nominal shear stress in R.C. section, design shear strength of concrete, maximum shear stress, design of shear reinforcement, minimum shear reinforcement, forms of shear reinforcement.	4.1		
2		20	Bond and types of bond, bond stress, check for bond stress, development length in tension and compression, anchorage value for hooks 90° bend and 45° bend standards lapping of bars, check for development length.	4.2		
3		21	Bond and types of bond, bond stress, check for bond stress, development length in tension and compression, anchorage value for hooks 90° bend and 45° bend standards lapping of bars, check for development length.	4.2		
4		22	Numerical problems on deciding whether shear reinforcement is required or not, check for adequacy of the section in shear. Design of shear reinforcement; Minimum shear reinforcement in beams (Explain through examples only).	4.3		
5		23	Doubt clear and revision of topics	1004		

REVIEW**Detailed Topic Plan:****Chapter No: 5 Chapter Name: Analysis and Design of T-Beam (LSM)**

5.1 General features, advantages, effective width of flange as per IS: 456-2000 code provisions. 5.2 Analysis of singly reinforced T-Beam, strain diagram & stress diagram, depth of neutral axis, moment of resistance of T-beam section with neutral axis lying within the flange. 5.3 Simple numerical problems on deciding effective flange width. (Problems only on finding moment of resistance of T-beam section when N.A. lies within or up to the bottom of flange shall be asked in written examination).

Sl No.	Week No.	Lecture No.	Topic to be Covered	Article No.	Date of Completion	Signature
1	4	24	General features, advantages, effective width of flange as per IS: 456-2000 code provisions.	5.1		
2	5	25	Analysis of singly reinforced T-Beam,	5.2		

			strain diagram & stress diagram, depth of neutral axis, moment of resistance of T-beam section with neutral axis lying within the flange.			
3		26	Analysis of singly reinforced T-Beam, strain diagram & stress diagram, depth of neutral axis, moment of resistance of T-beam section with neutral axis lying within the flange.	5.2		
4		27	Analysis of singly reinforced T-Beam, strain diagram & stress diagram, depth of neutral axis, moment of resistance of T-beam section with neutral axis lying within the flange.	5.2		
5		28	Analysis of singly reinforced T-Beam, strain diagram & stress diagram, depth of neutral axis, moment of resistance of T-beam section with neutral axis lying within the flange.	5.2		
6		29	Simple numerical problems on deciding effective flange width. (Problems only on finding moment of resistance of T-beam section when N.A. lies within or up to the bottom of flange shall be asked in written examination).	5.3		
7		30	Simple numerical problems on deciding effective flange width. (Problems only on finding moment of resistance of T-beam section when N.A. lies within or up to the bottom of flange shall be asked in written examination).	5.3		
8		31	Simple numerical problems on deciding effective flange width. (Problems only on finding moment of resistance of T-beam section when N.A. lies within or up to the bottom of flange shall be asked in written examination).	5.3		
9	6	32	Simple numerical problems on deciding effective flange width. (Problems only on finding moment of resistance of T-beam section when N.A. lies within or up to the bottom of flange shall be asked in written examination).	5.3		
10		33	Doubt clear and revision of topics	1005		
REVIEW						

Detailed Topic Plan:

Chapter No: 6 Chapter Name: Analysis and Design of Slab and Stair case (LSM)

6.1 Design of simply supported one-way slabs for flexure check for deflection control and shear.

6.2 Design of one-way cantilever slabs and cantilevers chajjas for flexure check for deflection control and check for development length and shear. 6.3 Design of two-way simply supported slabs for flexure with corner free to lift. 6.4 Design of dog-legged staircase 6.5 Detailing of reinforcement in stairs spanning longitudinally.

Sl No.	Week No.	Lecture No.	Topic to be Covered	Article No.	Date of Completion	Signature
1	6	34	Design of simply supported one-way slabs for flexure check for deflection control and shear.	6.1		
2		35	Design of simply supported one-way slabs for flexure check for deflection control and shear.	6.1		
3		36	Design of one-way cantilever slabs and cantilevers chajjas for flexure check for deflection control and check for development length and shear.	6.2		
4	7	37	Design of one-way cantilever slabs and cantilevers chajjas for flexure check for deflection control and check for development length and shear.	6.2		
5		38	Design of one-way cantilever slabs and cantilevers chajjas for flexure check for deflection control and check for development length and shear.	6.2		
6		39	Design of two-way simply supported slabs for flexure with corner free to lift.	6.3		
7		40	Design of two-way simply supported slabs for flexure with corner free to lift.	6.3		
8		41	Design of two-way simply supported slabs for flexure with corner free to lift.	6.3		
9		42	Design of dog-legged staircase	6.4		
10		43	Detailing of reinforcement in stairs spanning longitudinally.	6.5		
11	8	44	Detailing of reinforcement in stairs spanning longitudinally.	6.5		
12		45	Doubt clear and revision of topics	1006		

REVIEW

Detailed Topic Plan:

Chapter No: 7 Chapter Name: Design of Axially loaded columns and Footings (LSM)

7.1 Assumptions in limit state of collapse- compression. 7.2 Definition and classification of columns, effective length of column. Specification for minimum reinforcement; cover, maximum reinforcement, number of bars in rectangular, square and circular sections, diameter and spacing of lateral ties. 7.3 Analysis and design of axially loaded short square, rectangular and circular columns (with lateral ties only). 7.4 Types of footing, Design of isolated square column footing of uniform thickness for flexure and shear.

Sl No.	Week No.	Lecture No.	Topic to be Covered	Article No.	Date of Completion	Signature
1	8	46	Assumptions in limit state of collapse- compression.	7.1		
2		47	Definition and classification of	7.2		

			columns, effective length of column. Specification for minimum reinforcement; cover, maximum reinforcement, number of bars in rectangular, square and circular sections, diameter and spacing of lateral ties.			
3		48	Definition and classification of columns, effective length of column. Specification for minimum reinforcement; cover, maximum reinforcement, number of bars in rectangular, square and circular sections, diameter and spacing of lateral ties.	7.2		
4		49	Definition and classification of columns, effective length of column. Specification for minimum reinforcement; cover, maximum reinforcement, number of bars in rectangular, square and circular sections, diameter and spacing of lateral ties.	7.2		
5	9	50	Definition and classification of columns, effective length of column. Specification for minimum reinforcement; cover, maximum reinforcement, number of bars in rectangular, square and circular sections, diameter and spacing of lateral ties.	7.2		
6		51	Analysis and design of axially loaded short square, rectangular and circular columns (with lateral ties only).	7.3		
7		52	Analysis and design of axially loaded short square, rectangular and circular columns (with lateral ties only).	7.3		
8		53	Analysis and design of axially loaded short square, rectangular and circular columns (with lateral ties only).	7.3		
9		54	Analysis and design of axially loaded short square, rectangular and circular columns (with lateral ties only).	7.3		
10	10	55	Types of footing, Design of isolated square column footing of uniform thickness for flexure and shear.	7.4		
11		56	Types of footing, Design of isolated square column footing of uniform thickness for flexure and shear.	7.4		
12		57	Types of footing, Design of isolated square column footing of uniform thickness for flexure and shear.	7.4		
13		58	Types of footing, Design of isolated square column footing of uniform thickness for flexure and shear.	7.4		
14		59	Types of footing, Design of isolated square column footing of uniform	7.4		

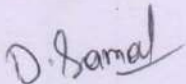
		thickness for flexure and shear.			
15	60	Doubt clear and revision of topics	1007		
REVIEW					

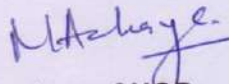
10) Examination Schedule:

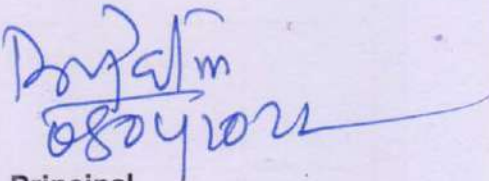
SI No.	Particulars of Test	Schedule	Type
1	Weekly Test (2 nd Week onwards)	Wednesday (4 th Sem.) & Thursday (6 th sem.)	10 Short Questions (02 Marks):
2	Internal Exam.-1	4 th Week	30 Marks (Long Questions)
3	Internal Exam.-2	8 th Week	30 Marks (Long Questions)

11) Assignment Collection/ Evaluation:

SI No.	Assignment No.	Content	Schedule
1	Assignment-1	Long Questions 7 Nos.(10 Marks) Short Questions 6 Nos. (5 Marks)	3 rd Week
2	Assignment-2	Long Questions 8 Nos.(10 Marks) Short Questions 6 Nos. (5 Marks)	6 th Week
3	Assignment-3	Long Questions 11 Nos.(10 Marks) Short Questions 8 Nos. (5 Marks)	9 th Week
4	Assignment-4	VST 100 Marks	10 th /11 th Week


Signature of Faculty


Signature of HOD


Principal

TEACHING-CUM-LESSON PLAN

- 1) Subject Code: Th 2.
- 2) Subject Title: Hydraulics & Irrigation Engg
- 3) Semester: 4th
- 4) Branch: Civil Engg.
- 5) No. of Classes / Week: 5/ week
- 6) Pre Requisite for the Subject: NIL / YES, If YES, give details: YES
 - Basic knowledge of the need of irrigation
 - Basic knowledge of pumps
 - Basic knowledge of purpose of irrigation system components
 - Basic knowledge of working principle of hydraulic pumps
 - Basic knowledge of cause and effect of water logging

7) Text Book to be referred by students:

Sl No.	Book	Author	Publication	Year (Edition)	Whether available in Library
i	Hydraulics	R.K.Bansal	Tmh Publishing	9 th	Yes
ii	Fluid Mechanics & Hydraulic Machines	Modi & Seth	Standard Book House	13 th	Yes
ii	Irrigation Engineering	N N Basak	Tmh Publishing	4 th	Yes

8) Course Coverage Schedule:

Sl No.	Week No.	Ch. No	No. of classes planned	Topic to be covered	Article		Expected Date of Completion	Remark
					From	To		
i	1	1	5	(PART –A) Hydrostatics	1.1	1.1		
					1.2	1.2		
ii	2	1	2		1.3	1.3,1001	28.03.22	
		2	3	Kinematics of fluid flow	2.1	2.1		
iii	3	2	5		2.1	2.2		
					2.2	2.2		
iv	4	2	5		2.3	2.3		
					2.4	2.4		
v	5	2	1		2.5	2.5,1002	21.04.22	
		3	4	Pumps	3.1	3.3,1003	27.04.22	

vi	6	1	4	(PART -B) Hydrology	1.1	1.4,1001	02.05.22	
		2	1	Water Requirement of Crops	2.1	2.2		
vii	7	2	3		2.3	2.4,1002	06.05.22	
		3	2	Flow irrigation	3.1	3.3		
viii	8	3	2		3.4	3.5,1003	12.05.22	
		4	2	Water logging and drainage	4.1	1004	15.05.22	
		5	1	Diversion head works and regulatory structures	5.1	5.3		
ix	9	5	3		5.4	5.4,1005	24.05.22	
		6	2	Cross drainage works	6.1	6.1		
					6.2	6.2,1006	29.05.22	
x	10	6	1	Dams	7.1	7.4,1007	03.06.22	
		7	4					
Total:		10	50					

9) Detail Class wise Plan:

Detailed Topic Plan:

Chapter No: 01 Chapter Name: Hydrostatics

1.1 Properties of fluid: density, specific gravity, surface tension, capillarity, viscosity and their uses 1.2 Pressure and its measurements: intensity of pressure, atmospheric pressure, gauge pressure, absolute pressure and vacuum pressure; relationship between atmospheric pressure, absolute pressure and gauge pressure; pressure head; pressure gauges. 1.3 Pressure exerted on an immersed surface: Total pressure, resultant pressure, expression for total pressure exerted on horizontal & vertical surface

Sl No.	Week No.	Lecture No.	Topic to be Covered	Article No.	Date of Completion	Signature
1.	1.	1.	(PART -A) Properties of fluid: density, specific gravity, surface tension, capillarity, viscosity and their uses Solve problems of density, specific gravity	1.1,		
2.		2.	Properties of fluid: surface tension, capillarity, viscosity and their uses Solve problems of surface tension	1.1		
3.		3.	Properties of fluid- viscosity and their uses	1.1		
4.		4.	Pressure and its measurements: intensity of pressure, atmospheric pressure, gauge pressure, absolute pressure	1.2		
5.		5.	Pressure and its measurements: vacuum pressure; relationship between atmospheric pressure, absolute pressure and gauge pressure; pressure head; pressure gauges	1.2		

			Solve problems of intensity of pressure			
6.	2.	6.	Pressure exerted on an immersed surface: Total pressure, resultant pressure, expression for total pressure exerted on horizontal & vertical surface Solve problems of Total pressure	1.3		
7.		7.	Pressure exerted on an immersed surface: Total pressure, resultant pressure, expression for total pressure exerted on horizontal & vertical surface Solve problems of Total pressure Doubt clear and revision of topics	1.3,1001		
REVIEW						

Detailed Topic Plan:

Chapter No: 02 Chapter Name: Kinematics Of Fluid Flow

2.1 Basic equation of fluid flow and their application: Rate of discharge, equation of continuity of liquid flow, total energy of a liquid in motion- potential, kinetic & pressure, Bernoulli's theorem and its limitations. Practical applications of Bernoulli's equation. 2.2 Flow over Notches and Weirs: Notches, Weirs, types of notches and weirs, Discharge through different types of notches and weirs-their application (No Derivation) 2.3 Types of flow through the pipes: uniform and non uniform; laminar and turbulent; steady and unsteady; Reynold's number and its application 2.4 Losses of head of a liquid flowing through pipes: Different types of major and minor losses. Simple numerical problems on losses due to friction using Darcy's equation, Total energy lines & hydraulic gradient lines (Concept Only). 2.5 Flow through the Open Channels: Types of channel sections-rectangular, trapezoidal and circular, discharge formulae- Chezy's and Manning's equation, Best economical section.

Sl No.	Week No.	Lecture No.	Topic to be Covered	Article No.	Date of Completion	Signature
1.		8	Basic equation of fluid flow and their application: Rate of discharge, equation of continuity of liquid flow, total energy of a liquid in motion- potential, kinetic & pressure, Bernoulli's theorem and its limitations. Practical applications of Bernoulli's equation. Solve problems	2.1		
2.		9	Basic equation of fluid flow and their application - total energy of a liquid in motion- potential, kinetic & pressure, Bernoulli's theorem and its limitations. Practical applications of Bernoulli's equation. Solve problems	2.1		
3.		10	Bernoulli's theorem and its limitations. Practical applications of Bernoulli's equation. Flow over Notches and Weirs: Notches, Weirs, & Solve problems	2.1, 2.2		

4.	3.	11	types of notches and weirs, Discharge through different types of notches and weirs-their application ,Solve problems	2.2		
5.		12	Discharge through different types of notches and weirs-their application	2.2		
6.		13	Discharge through different types of notches and weirs-their application	2.2		
7.		14	Types of flow through the pipes: uniform and non uniform; laminar and turbulent; steady and unsteady; Reynold's number and its application	2.3		
8.		15	Losses of head of a liquid flowing through pipes: Different types of major and minor losses.	2.4		
9.	4..	16	Simple numerical problems on losses due to friction using Darcy's equation, Total energy lines & hydraulic gradient lines	2.4		
10.		17	Flow through the Open Channels: Types of channel sections-rectangular, trapezoidal and circular, discharge formulae- Chezy's and Manning's equation, Best economical section.	2.5		
11.		18	Flow through the Open Channels: Types of channel sections- circular, discharge formulae, Solve problems	2.5		
12.		19	Chezy's and Manning's equation, Best economical section.	2.5		
13.		20	Chezy's and Manning's equation, Best economical section. Solve problems	2.5		
14.	5.	21	Doubt clear and revision of topics	1002		
REVIEW						

Detailed Topic Plan:

Chapter No: 03 Chapter Name: PUMPS

3.1 Type of pumps 3.2 Centrifugal pump: basic principles, operation, discharge, horse power & efficiency.
3.3 Reciprocating pumps: types, operation, discharge, horse power & efficiency

Sl No.	Week No.	Lecture No.	Topic to be Covered	Article No.	Date of Completion	Signature
1.		22	Introduction of types of pump	3.1		
2.		23	centrifugal pump. basic principles, operation, discharge, horse power & efficiency	3.2		
3.		24	Reciprocating pumps: types, operation, discharge, horse power & efficiency	3.3		

4.		25	Doubt clear and revision of topics	3.3, 1003		
REVIEW						

Detailed Topic Plan:

Chapter No: 01 Chapter Name: Hydrology

1.1 Hydrology Cycle 1.2 Rainfall: types, intensity, hyetograph 1.3 Estimation of rainfall, rain gauges, Its types(concept only), 1.4 Concept of catchment area, types, run-off, estimation of flood discharge by Dicken's and Ryve's formula.

Sl No.	Week No.	Lecture No.	Topic to be Covered	Article No.	Date of Completion	Signature
1.	6.	26	hydrologic cycle,	1.1		
2.		27	Rainfall: types, intensity, hyetograph	1.2		
3.		28	Estimation of rainfall, rain gauges, Its types(concept only), Concept of catchment area, types, run-off, estimation of flood discharge by Dicken's and Ryve's formula.	1.3, 1.4		
4.		29	Doubt clear and revision of topics	1004		

REVIEW

Detailed Topic Plan:

Chapter No: 02 Chapter Name: Water Requirement of Crops

2.1 Definition of irrigation, necessity, benefits of irrigation, types of irrigation 2.2 Crop season 2.3 Duty, Delta and base period their relationship, overlap allowance, kharif and rabi crops 2.4 Gross command area, culturable command area, Intensity of Irrigation, irrigable area, time factor, crop ratio

Sl No.	Week No.	Lecture No.	Topic to be Covered	Article No.	Date of Completion	Signature
1.	7.	30	Definition of irrigation, necessity, benefits of irrigation, types of irrigation	2.1		
2.		31	Crop season	2.2		
3.		32	Duty, Delta and base period their relationship, overlap allowance, kharif and rabi crops Gross command area, culturable command area, Intensity of Irrigation, irrigable area, time factor, crop ratio	2.3, 2.4		
4.		33	Doubt clear and revision of topics	1002		

REVIEW

Detailed Topic Plan:

Chapter No: 03 Chapter Name: Flow Irrigation

3.1 Canal irrigation, types of canals, loss of water in canals 3.2 Perennial irrigation 3.3 Different components of irrigation canals and their functions 3.4 Sketches of different canal cross-sections 3.5

Classification of canals according to their alignment, Various types of canal lining – Advantages and disadvantages

disadvantages

SI No.	Week No.	Lecture No.	Topic to be Covered	Article No.	Date of Completion	Signature
1.		34	Canal irrigation, types of canals, loss of water in canals	3.1		
2.		35	Canal irrigation, types of canals, loss of water in canals Perennial irrigation	3.1,3.2		
3.	8.	36	Different components of irrigation canals and their functions Sketches of different canal cross-sections	3.3,3.4		
4.		37	Classification of canals according to their alignment, Various types of canal lining – Advantages and disadvantages Doubt clear and revision of topics	3.5, 1003		
REVIEW						

Detailed Topic Plan:

Chapter No: 04 Chapter Name: Water Logging And Drainage

4.1 Causes and effects of water logging, detection, prevention and remedies

4.1 Causes and effects of water logging, detection, prevention and remedial measures						
Sl No.	Week No.	Lecture No.	Topic to be Covered	Article No.	Date of Completion	Signature
1.		38	Causes and effects of water logging	4.1		
2.		39	Doubt clear and revision of topics	4.1,1004		
REVIEW						

Detailed Topic Plan:

Chapter No: 05 Chapter Name: Diversion Head Works And Regulatory Structures

5.1 Necessity and objectives of diversion head works, weirs and barrages 5.2 General layout, functions of different parts of barrage 5.3 Silting and scouring 5.4 Functions of regulatory structures

different parts of barrage 5.3 Silting and scouring 5.4 Functions of regulatory

Sl No.	Week No.	Lecture No.	Topic to be Covered	Article No.	Date of Completion	Signature
1.	9.	40	Necessity and objectives of diversion head works, weirs and barrages General layout, functions of different parts of barrage	5.1,5.2		
2.		41	General layout, functions of different parts of barrage Siltting and scouring	5.2		
3.		42	Functions of regulatory structures	5.3,5.4		
4.		43	Doubt clear and revision of topics	1005		
REVIEW						

Detailed Topic Plan:

Chapter No: 06 Chapter Name: Cross Drainage Works

6.1 Functions and necessity of Cross drainage works - aqueduct, siphon, super passage, level crossing 6.2 Concept of each with help of neat sketch

Sl No.	Week No.	Lecture No.	Topic to be Covered	Article No.	Date of Completion	Signature
1.		44	Define and necessity of cross drainage works, Explain type of cross-drainage works- type-I, type-II, type-III.	6.1		
2.		45	type of cross drainage works. Aqueduct definition and brief explanation with sketch	6.2		
3.	10.	46	Doubt clear and revision of topics	1006		
REVIEW						

Detailed Topic Plan:

Chapter No: 07 Chapter Name: DAMS

7.1 Necessity of storage reservoirs, types of dams 7.2 Earthen dams: types, description, causes of failure and protection measures. 7.3 Gravity dam- types, description, Causes of failure and protection measures. 7.4 Spillways- Types (With Sketch) and necessity

Sl No.	Week No.	Lecture No.	Topic to be Covered	Article No.	Date of Completion	Signature
1.		47	selection of site for dam. Investigation works for dam site. Define types of dam-(brief discussion) Earthen dams-types of earthen dams & Causes of failure of dam- earthen dam, rock-fill dam, composite dam, steel dam, timber dam	7.1		
2.		48	Gravity dam, & Forces acting on gravity dam. Causes of failure of gravity dam, Precautions against failure of gravity dam. elementary profile of gravity dam, Practical profile of a gravity dam, economical height of a dam	7.2		
3.		49	Define spillways, & necessity of spillway and location of spillway, types of spillway-drop spillway. Ogee spillway, siphon spillway, trough spillway, shaft spillway, side channel spillway.	7.4		
4.		50	Doubt clear and revision of topics	1007		
REVIEW						

10) Examination Schedule:

Sl No.	Particulars of Test	Schedule	Type
1	Weekly Test (2 nd Week onwards)	Wednesday (4 th Sem.) & Thursday (6 th sem.)	10 Short Questions (02 Marks):
2	Internal Exam.-1	4 th Week	30 Marks (Long Questions)
3	Internal Exam.-2	8 th Week	30 Marks (Long Questions)

11) Assignment Collection/ Evaluation:

Sl No.	Assignment No.	Content	Schedule
1	Assignment-1	Long Questions 7 Nos.(10 Marks) Short Questions 6 Nos. (5 Marks)	3 rd Week
2	Assignment-2	Long Questions 8 Nos.(10 Marks) Short Questions 6 Nos. (5 Marks)	6 th Week
3	Assignment-3	Long Questions 11 Nos.(10 Marks) Short Questions 8 Nos. (5 Marks)	9 th Week
4	Assignment-4	VST 100 Marks	10 th /11 th Week

M. Biswal

Signature of Faculty

Signature of Asst. HOD

M. Acharya
Signature of HOD

Pradyumn
08/04/2022
Principal

TEACHING-CUM-LESSON PLAN

- 1) Subject Code: Theory 3
- 2) Subject Title: Survey I
- 3) Semester: 4th
- 4) Branch: Civil Engg.
- 5) No. of Classes / Week: 6
- 6) Pre Requisite for the Subject: NIL / YES, If YES, give details:

- Student should know about various survey terminology and carryout necessary corrections for error.
- They able to know the principle, purpose, equipment and error corrections in chain and compass surveying.
- They must get knowledge about the principle, purpose, equipment and error corrections in plane table and theodolite surveying.
- They able to studied the map nomenclature and apply skills in map interpretation.
- They will enhance their skill towards leveling and contouring with knowledge of purpose and different methods.
- They must have the knowledge about Compute area and volume using different numerical algebraic methods.

7) Text Book to be referred by students:

SI No.	Book	Author	Publication	Year (Edition)	Whether available in Library
i	Surveying & Levelling	N.N Basak.	TMH Publishing	2011	yes
ii	Surveying, Vol.-I&II	Dr.B.C.Punmia.	Laxmi Publication	1993	yes

8) Course Coverage Schedule:

SI No.	Week No.	Ch. No	No. of classes planed	Topic to be covered	Article		Expected Date of Completion	Remark
					From	To		
i	1	01	06	Introduction To Surveying, Linear Measurements	1.1	1.4		
ii	2	01	04	Introduction To Surveying, Linear Measurements	1.5	1001	02.04.2022	
		02	02	Chaining and Chain Surveying	2.1	2.3		
iii	03	02	06	Chaining and Chain Surveying	2.3	1002	11.04.2022	
iv	04	03	06	Angular Measurement and Compas Surveying	3.1	3.5		
v	05	03	03	Angular Measurement and Compas Surveying	3.6	1003	23.04.2022	
vi		04	03	Map Reading Cadastral Maps & Nomenclature	4.1	1004	27.04.2022	

vii	06	05	06	Plane Table Surveying	5.1	1005	03.05.2022	
viii	07	06	06	Theodolite Surveying and Traversing:	6.1	6.5		
ix	08	06	03	Theodolite Surveying and Traversing:	6.6	1006	13.05.2022	
x		07	03	Levelling and Contouring	7.1	7.6		
xi	09	07	06	Levelling and Contouring	7.7	1007	27.05.2022	
xii	10	08	06	Computation of Area & Volume	8.1	1008	03.06.2022	
Total:			60					

9) Detail Class wise Plan

Detailed Topic Plan:						
Chapter No: __01__ Chapter Name: Introduction To Surveying, Linear Measurements						
1.1 Surveying: Definition, Aims and objectives 1.2 Principles of survey-Plane surveying- Geodetic Surveying- Instrumental surveying. 1.3 Precision and accuracy of measurements, instruments used for measurement of distance, Types of tapes and chains. 1.4 Errors and mistakes in linear measurement – classification, Sources of errors and remedies. 1.5 Corrections to measured lengths due to-incorrect length, temperature variation, pull, sag, numerical problem applying corrections.						
SI No.	Week No.	Lecture No.	Topic to be Covered	Article No.	Date of Completion	Signature
01	01	01	Surveying: ➤ Definition, ➤ Aims and objectives	1.1		
02	01	02	Principles of survey-Plane surveying- Geodetic Surveying- Instrumental surveying.	1.2		
03	01	03	Precision and accuracy of measurements, ➤ instruments used for measurement of distance, ➤ Types of tapes and chains.	1.3		
04	01	04	Precision and accuracy of measurements, ➤ instruments used for measurement of distance, ➤ Types of tapes and chains.	1.3		
05	01	05	Errors and mistakes in ➤ linear measurement – classification, ➤ Sources of errors and remedies	1.4		
06	02	06	Errors and mistakes in ➤ linear measurement – classification, ➤ Sources of errors and remedies	1.4		
07	02	07	Corrections to measured lengths due to- ➤ incorrect length, ➤ temperature variation,	1.5		
08	02	08	Corrections to measured lengths due to- ➤ pull, sag, ➤ Numerical problem applying corrections.	1.5		
09	02	09	Corrections to measured lengths due to- ➤ pull, sag, ➤ Numerical problem applying corrections.	1.5		

10	02	10	Corrections to measured lengths > pull, sag, > Numerical problem applying corrections. Teachers Exam./ Doubt Clear/Revision:	1001	
Review					

Detailed Topic Plan:

Chapter No: 02 Chapter Name: Chaining and Chain Surveying

2.1 Equipment and accessories for chaining 2.2 Ranging – Purpose, signaling, direct and indirect ranging, Line ranger – features and use, error due to incorrect ranging. 2.3 Methods of chaining – Chaining on flat ground, Chaining on sloping ground – stepping method, Clinometer-features and use, slope correction. 2.4 Setting perpendicular with chain & tape, Chaining across different types of obstacles – Numerical problems on chaining across obstacles. 2.5 Purpose of chain surveying, Its Principles, concept of field book. Selection of survey stations, base line, tie lines, Check lines. 2.7 Offsets – Necessity, Perpendicular and Oblique offsets, Instruments for setting offset – Cross Staff, Optical Square. 2.8 Errors in chain surveying – compensating and accumulative errors causes & remedies, Precautions to be taken during chain surveying.

Sl No.	Week No.	Lecture No.	Topic to be Covered	Article No.	Date of Completion	Signature
11	02	11	Equipment and accessories for chaining Ranging – > Purpose, > signaling, > direct and indirect ranging,	2.1 2.2		
12	03	12	Ranging – > Line ranger – > features and use, > error due to incorrect ranging. Methods of chaining – > Chaining on flat ground, > Chaining on sloping ground – > stepping method, > Clinometer-features and use, > slope correction	2.2 2.3		
13	03	13	Setting perpendicular with chain & tape, > Chaining across different types of obstacles – Numerical problems on chaining across obstacles Purpose of chain surveying, > base line, > tie lines, > Check lines.	2.4 2.5		
14	03	14	Purpose of chain surveying, > base line, > tie lines, Offsets – > Necessity, > Perpendicular and Oblique offsets,	2.5 2.6		
15	03	15	Offsets – > Necessity, > Perpendicular and Oblique offsets,	2.6		
16	03	16	Offsets – > Instruments for setting offset –	2.6		

			➤ Cross Staff, Optical Square.			
17		17	Errors in chain surveying – ➤ compensating and accumulative errors causes & remedies,	2.7		
18	03	18	Errors in chain surveying – ➤ recautions to be taken during chain surveying. Teachers Exam./ Doubt Clear/Revision:	2.7 1002		
Review						

Detailed Topic Plan:

Chapter No: __03__ Chapter Name: Angular Measurement and Compas Surveying

3.1 Measurement of angles with chain, tape & compass 3.2 Compass – Types, features, parts, merits & demerits, testing & adjustment of compass 3.3 Designation of angles- concept of meridians – Magnetic, True, arbitrary; Concept of bearings – Whole circle bearing, Quadrantal bearing, Reduced bearing, suitability of application, numerical problems on conversion of bearings 3.4 Use of compasses – setting in field-centering, leveling, taking readings, concepts of Fore bearing, Back Bearing, Numerical problems on computation of interior & exterior angles from bearings. 3.5 Effects of earth's magnetism – dip of needle, magnetic declination, variation in declination, numerical problems on application of correction for declination. 3.6 Errors in angle measurement with compass – sources & remedies. 3.7 Principles of traversing – open & closed traverse, Methods of traversing. 3.8 Local attraction – causes, detection, errors, corrections, Numerical problems of application of correction due to local attraction. 3.9 Errors in compass surveying – sources & remedies. Plotting of traverse – check of closing error in closed & open traverse, Bowditch's correction, Gales table.

Sl No.	Week No.	Lecture No.	Topic to be Covered	Article No.	Date of Completion	Signature
19	04	19	3.1 Measurement of angles with chain, tape & compass	3.1		
20	04	20	3.2 Compass – ➤ Types, ➤ features, ➤ parts, ➤ merits & demerits, ➤ testing & adjustment of compass	3.2		
21	04	21	3.3 Designation of angles- ➤ concept of meridians ➤ Magnetic, ➤ True,	3.3		
22	04	22	arbitrary; Concept of bearings – ➤ Whole circle bearing, ➤ Quadrantal bearing, ➤ Reduced bearing, ➤ suitability of application, numerical problems on conversion of bearings	3.3		
23	04	23	3.4 Use of compasses – ➤ setting in field- ➤ centering, ➤ leveling, ➤ taking readings, ➤ concepts of Fore bearing, ➤ Back Bearing, ➤ Numerical problems on computation of interior & exterior angles from bearings	3.4		
24	04	24	3.5 Effects of earth's magnetism – ➤ dip of needle, ➤ magnetic declination, ➤ variation in declination, ➤ numerical problems on application of correction for declination.	3.5		

31	06	32	Objectives, principles and use of plane table surveying. Instruments & accessories used in plane table surveying.	5.1 5.2		
32	06	33	Methods of plane table surveying – ➤ Radiation, ➤ Intersection,	5.3		
33	06	34	Methods of plane table surveying – ➤ Traversing, ➤ Resection.	5.4		
34	06	35	Statements of ➤ TWO POINT and	5.4		
35	06	35	Statements of ➤ THREE POINT PROBLEM. ➤ Errors in plane table surveying and their corrections, precautions in plane table surveying.	5.4		
36	06	36	Errors in plane table surveying and their corrections, precautions in plane table surveying. Teachers Exam./ Doubt Clear/Revision:	5.4 1005		
Review						

Detailed Topic Plan:

Chapter No: 06 Chapter Name: Theodolite Surveying and Traversing

6.1 Purpose and definition of theodolite surveying 6.2 Transit theodolite- Description of features, component parts, Fundamental axes of a theodolite, concept of vernier, reading a vernier, Temporary adjustment of theodolite 6.3 Concept of transiting –Measurement of horizontal and vertical angles. 6.4 Measurement of magnetic bearings, deflection angle, direct angle, setting out angles, prolonging a straight line with theodolite, Errors in Theodolite observations. 6.5 Methods of theodolite traversing with – inclined angle method, deflection angle method, bearing method, Plotting the traverse by coordinate method, Checks for open and closed traverse. 6.6 Traverse computation – consecutive coordinates, latitude and departure, Gale's traverse table, Numerical problems on omitted measurement of lengths & bearings 6.7 Closing error – adjustment of angular errors, adjustment of bearings, numerical problems 6.8 Balancing of traverse – Bowditch's method, transit method, graphical method, axis method, calculation of area of closed traverse.

Sl No.	Week No.	Lecture No.	Topic to be Covered	Article No.	Date of Completion	Signature
37	07	37	Purpose and definition of theodolite surveying Transit theodolite- ➤ Description of features, ➤ component parts, ➤ Fundamental axes of a theodolite, ➤ concept of vernier, ➤ reading a vernier,	6.1 6.2		
38	07	38	Transit theodolite- ➤ Temporary adjustment of theodolite	6.2		
39	07	39	Concept of transiting – Measurement of horizontal and vertical angles.	6.3		
40	07	40	Measurement of magnetic bearings, ➤ deflection angle, ➤ direct angle,	6.4		

			➤ setting out angles, ➤ prolonging a straight line with theodolite, Errors in Theodolite observations			
41	07	41	Methods of theodolite traversing with – ➤ inclined angle method, ➤ deflection angle method, ➤ bearing method, ➤ Plotting the traverse by coordinate method, ➤ Checks for open and closed traverse.	6.5		
42	07	42	Traverse computation – ➤ consecutive coordinates, ➤ latitude and departure, ➤ Gale's traverse table, Numerical problems on omitted measurement of lengths & bearings	6.6		
43	08	43	Closing error – ➤ adjustment of angular errors, ➤ adjustment of bearings, ➤ numerical problems	6.7		
44	08	44	Closing error – ➤ adjustment of angular errors, ➤ adjustment of bearings, ➤ numerical problems	6.7		
45	08	45	Balancing of traverse – ➤ Bowditch's method, ➤ transit method, ➤ graphical method, ➤ axis method, ➤ calculation of area of closed traverse. Teachers Exam./ Doubt Clear/Revision:	6.8 1006		
Review						

Detailed Topic Plan:

Chapter No: 07 Chapter Name: Levelling and Contouring

7.1 Definition and Purpose and types of leveling– concepts of level surface, Horizontal surface, vertical surface, datum, R. L., B.M. 7.2 Instruments used for leveling, concepts of line of collimation, axis of bubble tube, axis of telescope, Vertical axis. 7.3 Levelling staff – Temporary adjustments of level, taking reading with level, concept of bench mark, BS, IS, FS, CP, HI. 7.4 Field data entry – level Book – height of collimation method and Rise & Fall method, comparison, Numerical problems on reduction of levels applying both methods, Arithmetic checks. 7.5 Effects of curvature and refraction, numerical problems on application of correction. 7.6 Reciprocal leveling – principles, methods, numerical problems, precise leveling. 7.7 Errors in leveling and precautions, Permanent and temporary adjustments of different types of levels. 7.8 Definitions, concepts and characteristics of contours. 7.9 Methods of contouring, plotting contour maps, Interpretation of contour maps, toposheets. 7.10 Use of contour maps on civil engineering projects – drawing cross sections from contour maps, locating proposal routes of roads / railway / canal on a contour map, computation of volume of earthwork from contour map for simple structure. 7.11 Map Interpretation: Interpret Human and Economic Activities (i.e.: Settlement, Communication, Land use etc.), Interpret Physical landform (i.e.: Relief, Drainage Pattern etc.), Problem Solving and Decision Making

Sl No.	Week No.	Lecture No.	Topic to be Covered	Article No.	Date of Completion	Signature
46	08	46	Definition and Purpose and types of leveling- ➤ concepts of level surface, ➤ Horizontal surface, ➤ vertical surface, ➤ datum, ➤ R. L., ➤ B.M.	7.1		

47	08	47	Instruments used for leveling, ➤ concepts of line of collimation, ➤ axis of bubble tube, ➤ axis of telescope, ➤ Vertical axis.	7.2		
48	08	48	Levelling staff – ➤ Temporary adjustments of level, ➤ taking reading with level, concept of bench mark, BS, IS, FS, CP, HI.	7.3		
49	09	49	Field data entry – ➤ level Book – ➤ height of collimation method and Rise & Fall method, ➤ comparison, ➤ Numerical problems on reduction of levels applying both methods, Arithmetic checks.	7.4		
50	09	50	Effects of curvature and refraction, ➤ numerical problems on application of correction.	7.5		
51	09	51	Reciprocal leveling – ➤ principles, ➤ methods, ➤ numerical problems, precise leveling.	7.6		
52	09	52	Definitions, concepts and characteristics of contours. Methods of contouring, plotting contour maps, Interpretation of contour maps, toposheets.	7.8 7.9		
53	09	53	Use of contour maps on civil engineering projects – drawing cross sections from contour maps, locating proposal routes of roads / railway / canal on a contour map, c	7.10		
54	09	54	Map Interpretation: Interpret Human and Economic Activities (i.e.: Settlement, Communication, Land use etc.), Interpret Physical landform (i.e.: Relief, Drainage Pattern etc.), Problem Solving and Decision Making Teachers Exam./ Doubt Clear/Revision:	7.11 1007		
Review						

Detailed Topic Plan:

Chapter No: __08__ Chapter Name: Computation of Area & Volume

8.1 Determination of areas, computation of areas from plans. 8.2 Calculation of area by using ordinate rule, trapezoidal rule, Simpson's rule. 8.3 Calculation of volumes by prismoidal formula and trapezoidal formula, Prismoidal corrections, curvature correction for volumes.

Sl No.	Week No.	Lecture No.	Topic to be Covered	Article No.	Date of Completion	Signature
55	10	55	Determination of areas, computation of areas from plans. Calculation of area by using ➤ ordinate rule, ➤ trapezoidal rule, ➤ Simpson's rule.	8.1 8.2		
56	10	56	Calculation of area by using ➤ trapezoidal rule,	8.2		
57	10	57	Calculation of area by using ➤ Simpson's rule.	8.2		

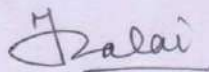
58	10	58	8.3 Calculation of volumes by ➤ prismoidal formula and	8.3		
59	10	59	8.3 Calculation of volumes by ➤ prismoidal formula and ➤ trapezoidal formula,	8.3		
60	10	60	8.3 Calculation of volumes by ➤ Prismoidal corrections, ➤ curvature correction for volumes.. Teachers Exam./ Doubt Clear/Revision:	8.3 1008		
Review						

10) Examination Schedule:

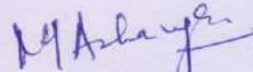
SI No.	Particulars of Test	Schedule	Type
1	Weekly Test (2 nd Week onwards)	Wednesday (4 th Sem.) & Thursday (6 th sem.)	10 Short Questions (02 Marks):
2	Internal Exam.-1	4 th Week	30 Marks (Long Questions)
3	Internal Exam.-2	8 th Week	30 Marks (Long Questions)

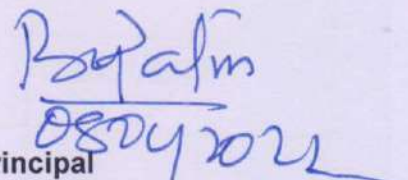
11) Assignment Collection/ Evaluation:

SI No.	Assignment No.	Content	Schedule
1	Assignment-1	Long Questions 7 Nos.(10 Marks) Short Questions 6 Nos. (5 Marks)	3 rd Week
2	Assignment-2	Long Questions 8 Nos.(10 Marks) Short Questions 6 Nos. (5 Marks)	6 th Week
3	Assignment-3	Long Questions 11 Nos.(10 Marks) Short Questions 8 Nos. (5 Marks)	9 th Week
4	Assignment-4	VST 100 Marks	10 th /11 th Week


Signature of Faculty

Signature of Asst. HOD


Signature of HOD


Principal



TEACHING-CUM-LESSON PLAN

- 1) Subject Code: TH- 4
 2) Subject Title: Highway Engg.
 3) Semester: 4th
 4) Branch: civil
 5) No. of Classes / Week: 4
 6) Pre Requisite for the Subject: NIL / YES, If YES,
 i) Elements of Civil Engineering & Mechanics
 ii) Geotechnical Engineering-1
 7) Text Book to be referred by students:

Sl No.	Book	Author	Publication	Year (Edition)	Whether available in Library
i	Highway Engineering	S.K.Khanna & C.E.G. Justo	Nem Chand & Bros	5th	yes

8) Course Coverage Schedule:

Sl No.	Week No.	Ch. No	No. of classes planed	Topic to be covered	Article		Expected Date of Completion	Remark
					From	To		
i	1	1	04	Introduction	1.1	1.4,1001	26.03.22	
ii	2	2	04	Road Geometrics	2.1	2.2		
iii	3	2	02	Road Geometrics	2.3	2.3,1002	07.04.22	
iv		3	02	Road Materials	3.1	3.2		
v	4	3	02	Road Materials	3.3	3.4,1003	15.04.22	
vi		4	02	Road Pavement	4.1	4.2		
vii	5	4	04	Road Pavement	4.3	4.4		
viii	6	4	01	Road Pavement	4.5	4.6,1004	28.04.22	
ix		5	03	Hill Roads	5.1	5.2		
x	7	5	01	Hill Roads	5.2	5.2,1005	04.05.22	
xi		6	03	Road Drainage	6.1	6.2,1006		
xii	8	6	02	Road Drainage	6.2	6.2,1006	13.05.22	
xiii		7	02	Road Maintenance	7.1	7.3		
xiv	9	7	04	Road Maintenance	7.4	7.4,1007	27.05.22	
xv	10	8	04	Construction equipments	8.1	8.5,1008	03.06.22	

Total:	8	40				
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9) Detail Class wise Plan:

Detailed Topic Plan:

Chapter No: 01 Chapter Name: Introduction

1.1 Importance of Highway transportation: importance organizations like Indian roads congress, Ministry of Surface Transport, Central Road Research Institute. 1.2 Functions of Indian Roads Congress 1.3 IRC classification of roads 1.4 Organisation of state highway department

Sl No.	Week No.	Lecture No.	Topic to be Covered	Article No.	Date of Completion	Signature
1	1	1	Importance of Highway transportation: importance organizations like Indian roads congress, Ministry of Surface Transport, Central Road Research Institute.	1.1		
2		2	Functions of Indian Roads Congress	1.2		
3		3	IRC classification of roads	1.3		
			Organisation of state highway department	1.4		
4		4	Doubt clear and revision of topics	1001		

Review:

Detailed Topic Plan:

Chapter No: 02 Chapter Name: Road Geometrics

2.1 Glossary of terms used in geometric and their importance, right of way, formation width, road margin, road shoulder, carriage way, side slopes, kerbs, formation level, camber and gradient 2.2 Design and average running speed, stopping and passing sight distance 2.3 Necessity of curves, horizontal and vertical curves including transition curves and super elevation, Methods of providing super – elevation

Sl No.	Week No.	Lecture No.	Topic to be Covered	Article No.	Date of Completion	Signature
1	2	1	Glossary of terms used in geometric and their importance, right of way	2.1		
2		2	formation width, road margin, road shoulder, carriage way, side slopes, kerbs, formation level, camber and gradient	2.1		
3		3	Design and average running speed,	2.2		
4		4	stopping and passing sight distance	2.2		
5	3	5	Necessity of curves, horizontal and vertical curves including transition curves and super elevation, Methods of providing super – elevation	2.3		
6		6	Doubt clear and revision of topics	1002		

Review:

Chapter No: -03 Chapter Name: Road Materials

3.1 Difference types of road materials in use: soil, aggregates, and binders 3.2 Function of soil as highway Subgrade 3.3 California Bearing Ratio: methods of finding CBR valued in the laboratory and at site and their significance 3.4 Testing aggregates: Abrasion test, impact test, crushing strength test, water absorption test & soundness test

Sl No.	Week No.	Lecture No.	Topic to be Covered	Article No.	Date of Completion	Signature
1		11	Difference types of road materials in use: soil, aggregates, and binders	3.1		
2		12	Function of soil as highway Subgrade	3.2		
3	4	13	California Bearing Ratio: methods of finding CBR valued in the laboratory and at site and their significance Testing aggregates: Abrasion test, impact test, crushing strength test, water absorption test & soundness test	3.3 3.4		
4		14	Doubt clear and revision of topics	1003		

Review:

Detailed Topic Plan:

Chapter No: -04 Chapter Name: Road Pavements

4.1 Road Pavement: Flexible and rigid pavement, their merits and demerits, typical cross-sections, functions of various components Flexible pavements: 4.2 Sub-grade preparation: Setting out alignment of road, setting out bench marks, control pegs for embankment and cutting, borrow pits, making profile of embankment, construction of embankment, compaction, stabilization, preparation of subgrade, methods of checking camber, gradient and alignment as per recommendations of IRC, equipment used for subgrade preparation 4.3 Sub base Course: Necessity of sub base, stabilized sub base, purpose of stabilization (no designs) Types of stabilization Mechanical stabilization• Lime stabilization• Cement stabilization• Fly ash stabilization• 4.4 Base Course: Preparation of base course, Brick soling, stone soling and metalling, Water Bound Macadam and wet-mix Macadam, Bituminous constructions: Different types 4.5 Surfacing: Surface dressing• (i) Premix carpet and (ii) Semi dense carpet Bituminous concrete• Grouting• 4.6 Rigid Pavements: Concept of concrete roads as per IRC specifications

Sl No.	Week No.	Lecture No.	Topic to be Covered	Article No.	Date of Completion	Signature
1		15	Road Pavement: Flexible and rigid pavement, their merits and demerits, typical cross-sections, functions of various components Flexible pavements:	4.1		
2		16	Sub-grade preparation: Setting out alignment of road, setting out bench marks, control pegs for embankment and cutting, borrow pits, making profile of embankment, construction of embankment, compaction, stabilization, preparation of subgrade,	4.1		
3	5	17	methods of checking camber, gradient and alignment as per recommendations of IRC, equipment used for subgrade preparation	4.2		

4		4	Sub base Course: Necessity of sub base, stabilized sub base, purpose of stabilization (no designs) Types of stabilization Mechanical stabilization• Lime stabilization• Cement stabilization• Fly ash stabilization•	4.3		
5		5	Base Course: Preparation of base course, Brick soling, stone soling and metalling, Water Bound Macadam and wet-mix Macadam, Bituminous constructions: Different types	4.4		
6		6	Surfacing: Surface dressing (i) Premix carpet and (ii) Semi dense carpet Bituminous ,concrete ,Grouting	4.5		
	6		Rigid Pavements: Concept of concrete roads as per IRC specifications	4.6		
7		7	Doubt clear and revision of topics	1004		
Review:						

Detailed Topic Plan:

Chapter No: -05 Chapter Name: Hill Roads

5.1 Introduction: Typical cross-sections showing all details of a typical hill road in cut, partly in cutting and partly in filling 5.2 Breast Walls, Retaining walls, different types of bend

Sl No.	Week No.	Lecture No.	Topic to be Covered	Article No.	Date of Completion	Signature
1		1	Introduction: Typical cross-sections showing all details of a typical hill road in cut, partly in cutting and partly in filling	5.1		
2		2	Introduction: Typical cross-sections showing all details of a typical hill road in cut, partly in cutting and partly in filling	5.1		
3	7	3	Breast Walls, Retaining walls, different types of bends Breast Walls, Retaining walls, different types of bends	5.2 5.2		
4		4	Doubt clear and revision of topics	1005		

Review:

Detailed Topic Plan:

Chapter No: -06 Chapter Name: Road Drainage

6.1 Necessity of road drainage work, cross drainage works 6.2 Surface and sub-surface drains and storm water drains. Location, spacing and typical details of side drains, side ditches for surface drainage, intercepting drains, pipe drains in hill roads, details of drains in cutting embankment, typical cross sections.

Sl No.	Week No.	Lecture No.	Topic to be Covered	Article	Date of Completion	Signatur
1		1	Necessity of road drainage work, cross drainage works	6.1		
2		2	Surface and sub-surface drains and storm water drains	6.2		

		28	Location, spacing, typical details of side drains	6.2		
4	8	29	side ditches for surface drainage, intercepting, drains, pipe drains in hill roads, details of drains in cutting embankment typical cross sections	6.2 6.2		
5		30	Doubt clear and revision of topics	1006		

Review:

Detailed Topic Plan:

Chapter No: -07 Chapter Name: Road Maintenance

7.1 Common types of road failures – their causes and remedies 7.2 Maintenance of bituminous road such as patch work and resurfacing 7.3 Maintenance of concrete roads – filling cracks, repairing joints, maintenance of shoulders (berm), maintenance of traffic control devices 7.4 Basic concept of traffic study, Traffic safety and traffic control signal

Sl No.	Week No.	Lecture No.	Topic to be Covered	Article No.	Date of Completion	Signature
1		31	Common types of road failures – their causes and remedies	7.1		
2		32	Common types of road failures – their causes and remedies	7.1		
3	9	33	Maintenance of bituminous road such as patch work and resurfacing	7.2		
4		34	Maintenance of concrete roads – filling cracks, repairing joints, maintenance of shoulders (berm), maintenance of traffic control devices	7.3		
5		35	Maintenance of concrete roads – filling cracks, repairing joints, maintenance of shoulders (berm), maintenance of traffic control devices Basic concept of traffic study, Traffic safety and traffic control signal	7.3 7.4		
6		36	Doubt clear and revision of topics	1007		

Review:

Detailed Topic Plan:

Chapter No: -08 Chapter Name: Construction equipments:

Preliminary ideas of the following plant and equipment: 8.1 Hot mixing plant 8.2 Tipper, tractors (wheel and crawler) scraper, bulldozer, dumpers, shovels, graders, roller dragline 8.3 Asphalt mixer and tar boilers 8.4 Road pavers 8.5 Modern construction equipments for roads.

Sl No.	Week No.	Lecture No.	Topic to be Covered	Article No.	Date of Completion	Signature
1	10	37	Preliminary ideas of the following plant and equipment, Hot mixing plant	8.1		
2		38	Tipper, tractors (wheel and crawler)	8.2		

			scraper, bulldozer, dumpers, shovels, graders, roller dragline			
3		3	Asphalt mixer and tar boilers, Road pavers Modern construction equipments for roads.	8.3, 8.4 8.5		
4		4	Doubt clear and revision of topics	1008		
Review:						

10) Examination Schedule:

Sl No.	Particulars of Test	Schedule	Type
1	Weekly Test (2 nd Week onwards)	Wednesday (4 th Sem.) & Thursday (6 th sem.)	10 Short Questions (02 Marks):
2	Internal Exam.-1	4 th Week	30 Marks (Long Questions)
3	Internal Exam.-2	8 th Week	30 Marks (Long Questions)

11) Assignment Collection/ Evaluation:

Sl No.	Assignment No.	Content	Schedule
1	Assignment-1	Long Questions 7 Nos.(10 Marks) Short Questions 6 Nos. (5 Marks)	3 rd Week
2	Assignment-2	Long Questions 8 Nos.(10 Marks) Short Questions 6 Nos. (5 Marks)	6 th Week
3	Assignment-3	Long Questions 11 Nos.(10 Marks) Short Questions 8 Nos. (5 Marks)	9 th Week
4	Assignment-4	VST 100 Marks	10 th /11 th Week

Amrita Mallick
Signature of Faculty

Signature of Asst. HOD

R. Acharya
Signature of HOD

R. Acharya
08042022
Principal