Discipline: Civil Engneering	Semestar-5th	Name Of the teaching Faculty: Smt.Pramila Kumari Gouda
Subject: STRUCTURAL DESIGN– II Th2.	**No. of Days/per week class alloted:4**	**Semestar From Date : 14/07/2025 To Date: 15/11/2025**
		No. Of Weeks: 15
Week	**Day**	**Theory Topics to be covered**
1st	1st	**CHAPTER -1** Introduction:1.1 Common steel structures, Advantages & disadvantages of steel structures.
	2nd	1.2 Types of steel, properties of structural steel. 1.3 Rolled steel sections, special considerations in steel design.
	3rd	1.4 Loads and load combinations. 1.5 Structural analysis and design philosophy.
	4th	1.6 Brief review of Principles of Limit State design.
2nd	1st	**CHAPTER-2** Structural Steel Fasteners and Connections. 2.1 Bolted Connections 2.1.1 Classification of bolts, advantages and disadvantages of bolted connections.
	2nd	2.1.2 Different terminology, spacing and edge distance of bolt holes
	3rd	3 Types of bolted connections. 2.1.4 Types of action of fasteners, assumptions and principles of design.
	4th	2.1.5 Strength of plates in a joint, strength of bearing type bolts (shear capacity& bearing capacity), reduction factors, and shear capacity of HSFG bolts
3rd	1st	2.1.5 Strength of plates in a joint, strength of bearing type bolts (shear capacity& bearing capacity), reduction factors, and shear capacity of HSFG bolts
	2nd	2.1.6 Analysis & design of Joints using bearing type and HSFG bolts (except eccentric load and prying forces) 2.1.7 Efficiency of a joint.
	3rd	Welded Connections: 2.2.1 Advantages and Disadvantages of welded connection
	4th	Types of welded joints and specifications for welding 2.2.3 Design stresses in welds.
4th	1st	Strength of welded joints.
	2nd	Numerical solving
	3rd	Numerical solving
	4th	Numerical solving
5th	1st	**CHAPTER -3** Design of Steel tension Members 3.1 Common shapes of tension members
	2nd	3.2 Maximum values of effective slenderness ratio.
	3rd	3.4 Analysis and Design of tension members.(Considering strength only and concept of block shear failure.)

	4th	3.4 Analysis and Design of tension members.(Considering strength only and concept of block shear failure.)
6th	1st	3.4 Analysis and Design of tension members.(Considering strength only and concept of block shear failure.)
	2nd	3.4 Analysis and Design of tension members.(Considering strength only and concept of block shear failure.)
	3rd	3.4 Analysis and Design of tension members.(Considering strength only and concept of block shear failure.)
	4th	Numerical solving
7th	1st	Numerical solving
	2nd	**CHAPTER -4** Design of Steel Compression members. 4.1 Common shapes of compression members.
	3rd	4.2 Buckling class of cross sections, slenderness ratio
	4th	4.3 Design compressive stress and strength of compression members.
8th	1st	4.3 Design compressive stress and strength of compression members.
	2nd	4.4 Analysis and Design of compression members (axial load only).
	3rd	4.4 Analysis and Design of compression members (axial load only).
	4th	4.4 Analysis and Design of compression members (axial load only).
9th	1st	4.4 Analysis and Design of compression members (axial load only).
	2nd	**CHAPTER-5** Design of Steel beams: 5.1 Common cross sections and their classification.
	3rd	5.2 Deflection limits, web buckling and web crippling.
	4th	5.2 Deflection limits, web buckling and web crippling.
10th	1st	5.2 Deflection limits, web buckling and web crippling.
	2nd	5.3 Design of laterally supported beams against bending and shear.
	3rd	5.3 Design of laterally supported beams against bending and shear.
	4th	5.3 Design of laterally supported beams against bending and shear.
11th	1st	5.3 Design of laterally supported beams against bending and shear.
	2nd	**CHAPTER-6** Design of Tubular Steel Structures: 6.1 Round Tubular Sections, Permissible Stresses
	3rd	6.3 Joints in Tubular trusses
	4th	Numerical solved
12th	1st	Numerical solved
	2nd	Numerical solved
	3rd	CHAPTER-7 Design of Masonry Structures: Design considerations for Masonry
	4th	
	1st	Load Bearing & Non-Load Bearing walls,

13th	2nd	Permissible stresses, Slenderness Ratio, Effective Length, Height & Thickness.
	3rd	Permissible stresses, Slenderness Ratio, Effective Length, Height & Thickness.
	4th	Permissible stresses, Slenderness Ratio, Effective Length, Height & Thickness.
14th	1st	Numerical solving
	2nd	Numerical solving
	3rd	Numerical solving
	4th	Numerical solving & Previous year question answer discussion
15th	1st	Numerical solving & Previous year question answer discussion
	2nd	Numerical solving & Previous year question answer discussion
	3rd	Numerical solving & Previous year question answer discussion
	4th	Numerical solving & Previous year question answer discussion

SIGNATURE OF FACULTY

Discipline-Civil Engneering	Semestar- 5th	Name Of the teaching Faculty: Manoranjan Nayak
Subject-Railway & Bridge Engineering	No. of Days/per week class alloted:4	Semestar From Date : 14/07/2025 To Date: 15/11/2025
		No. Of Weeks: 15
Week	**Class Day**	**Theory/Practical Topics**
1st	1st	**Section A** **Chapter- 1 Introduction** Railway terminology Advantages of railways
	2nd	Classification of Indian Railways
	3rd	**Chapter-2 Permanent way** Definition and components of a permanent way
	4th	Concept of gauge, different gauges prevalent in India
2nd	1st	Suitability of these gauges under different conditions
	2nd	**Chapter- 3 Track materials** Rails
	3rd	Functions and requirement of rails
	4th	Types of rail sections, length of rails
3rd	1st	Rail joints – types
	2nd	Requirement of an ideal joint
	3rd	Purpose of welding of rails & its advantages
	4th	Creep- definition, cause & prevention
4th	1st	Creep- definition, cause & prevention
	2nd	Sleepers Definition, function
	3rd	Requirements of sleepers
	4th	Classification of sleepers
5th	1st	Advantages & disadvantages of different types of sleepers
	2nd	Ballast
	3rd	Functions & requirements of ballast

	4th	Materials for ballast
6th	1st	Fixtures for Broad gauge
	2nd	Connection of rails to rail-fishplate, fish bolts
	3rd	Connection of rails to sleepers
	4th	**Chapter- 4 Geometric for broad gauge** Typical cross – sections of single & double broad gauge railway track in cutting and embankment
7th	1st	Permanent & temporary land width
	2nd	Gradients for drainage
	3rd	Super elevation – necessity & limiting valued
	4th	**Chapter- 5 Points and crossings** Definition, necessity of Points and crossings
8th	1st	Types of points & crossings with tie diagrams
	2nd	Types of points & crossings with tie diagrams
	3rd	**Chapter-5 Laying & maintenance of track** Methods of Laying
	4th	Maintenance of track
9th	1st	Duties of a permanent way inspector
	2nd	**Section B** **Chapter-1 Introduction to bridges** Definitions
	3rd	Components of a bridge
	4th	Classification of bridges
10th	1st	Requirements of an ideal bridge
	2nd	Requirements of an ideal bridge
	3rd	**Chapter-2 Bridge site investigation, hydrology & planning** Selection of bridge site, Alignment
	4th	Selection of bridge site, Alignment
	1st	Determination of Flood Discharge

11th	2nd	Waterway
	3rd	economic span
	4th	Afflux, clearance
12th	1st	free board
	2nd	**Chapter-3 Bridge foundation** Scour depth minimum depth of foundation
	3rd	Types of bridge foundations – spread foundation,
	4th	Pile foundation- well foundation – sinking of wells
13th	1st	Pile foundation- well foundation – sinking of wells
	2nd	caission foundation
	3rd	Coffer dams
	4th	**Chapter-4 Bridge substructure and Approaches** Types of piers
14th	1st	Types of abutments
	2nd	Types of wing walls
	3rd	Approaches
	4th	**Chapter- 5 Culvert & Cause ways** Types of culvers – brief description
15th	1st	Types of culvers – brief description
	2nd	Types of causeways – brief description
	3rd	Types of causeways – brief description
	4th	Types of causeways – brief description
		Signature

Discipline: Civil Engneering	Semestar- 5th	Name Of the teaching Faculty: Smt. Laxmipriya Mohapatra
Subject: Water Supply & Waste Water Engineering (Th.4)	No. of Days/per week class alloted:5	Semestar From Date : 14/07/2025 To Date: 15/11/2025
		No. Of Week - 15
Week	**Day**	**Theory Topics to be covered**
1st	1st	**Chapter -1** **Introduction to Water Supply, Quantity and Quality of water:** 1.1 Necessity of treated water supply.
	2nd	1.2 Per capita demand, variation in demand and factors affecting demand.
	3rd	1.3 Methods of forecasting population
	4th	Numerical problems using different methods.
	5th	1.4 Impurities in water – organic and inorganic,
2nd	1st	Harmful effects of impurities
	2nd	1.5 Analysis of water –physical,
	3rd	chemical analysis
	4th	Bacteriological analysis
	5th	1.6 Water quality standards for different uses
3rd	1st	**2.Sources and Conveyance of water:** 2.1 Surface sources – Lake, stream, river and impounded reservoir
	2nd	2.2 Underground sources – aquifer type & occurrence – Infiltration gallery, infiltration well, springs, well
	3rd	2.3 Yield from well- method s of determination,
	4th	Numerical problems using yield formulae.
	5th	2.4 Intakes – types, description of river intake, reservoir intake, canal intake
4th	1st	2.5 Pumps for conveyance & distribution – types, selection, installation
	2nd	2.6 Pipe materials – necessity, suitability, merits & demerits of each type
	3rd	2.7 Pipe joints – necessity, types of joints, suitability, methods of jointing Laying of pipes – method
	4th	**3.Treatment of water:** 3.1 Flow diagram of conventional water treatment system
	5th	3.2 Treatment process / units : 3.2.1 Aeration ; Necessity

5th	1st	3.2.2 Plain Sedimentation : Necessity, working principles,
	2nd	Sedimentation tanks – types, essential features, operation & maintenance
	3rd	3.2.3 Sedimentation with coagulation: Necessity, principles of coagulation, types of coagulants, Flash Mixer, Flocculator, Clarifier
	4th	3.2.4 Filtration : Necessity, principles, types of filters- Slow Sand Filter
	5th	Rapid Sand Filter
6th	1st	Pressure Filter
	2nd	3.2.5 Disinfection : Necessity, methods of disinfection
	3rd	Chlorination – free and combined chlorine demand, available chlorine, residual chlorine, pre-chlorination, break point chlorination,
	4th	3.2.6 Softening of water – Necessity, Methods of softening
	5th	Lime soda process and Ion exchange method
7th	1st	**4.Distribution system And Appurtenance in distribution system:** 4.1 General requirements, types of distribution system
	2nd	gravity system
	3rd	Direct and combined distribution system
	4th	4.2 Methods of supply – intermittent and continuous
	5th	4.3 Distribution system layout – types, comparison, suitability
8th	1st	4.4 Valves-types, features, uses, purpose
	2nd	sluice valves, check valves, air valves
	3rd	scour valves, Fire hydrants, Water meters
	4th	**5.W/s plumbing in building :** 5.1 Method of connection from water mains to building supply
	5th	General layout of plumbing arrangement for water supply in single storied and multi-storied building as per I.S. code
9th	1st	**6.Introduction to waste water engineering:** 6.1 Aims and objectives of sanitary engineering
	2nd	6.2 Definition of terms related to sanitary engineering
	3rd	6.3 Systems of collection of wastes– Conservancy system

	4th	Water Carriage System
	5th	Features, comparison, suitability of conservancy and water carriage system.
10th	1st	**7.Quantity and Quality of sewage:** 7.1 Quantity of sanitary sewage – domestic & industrial sewage, variation in sewage flow
	2nd	Numerical problem on computation quantity of sanitary sewage.
	3rd	7.2 Computation of size of sewer, application of Chazy's formula
	4th	Limiting velocities of flow : self-cleaning and scouring
	5th	7.3 General importance, strength of sewage, Characteristics of sewage-physical,
11th	1st	chemical & biological characteristics
	2nd	7.4 Concept of sewage-sampling, tests for – solids, pH, dissolved oxygen, BOD, COD
		8.Sewerage system: 8.1 Types of system-separate, combined,
	3rd	partially separate , features,
	4th	comparison between the types, suitability
	5th	8.2 Shapes of sewer – rectangular, circular, avoid-features, suitability
12th	1st	8.3 Laying of sewer-setting out sewer alignment
	2nd	**9.Sewer appurtenances and Sewage Disposal:** 9.1 Manholes and Lamp holes – types, features, location, function
	3rd	9.2 Inlets, Grease & oil trap – features, location, function
	4th	9.3 Storm regulator, inverted siphon – features, location, function
	5th	9.4 Disposal on land – sewage farming, sewage application and dosing,
13th	1st	sewage sickness-causes and remedies
	2nd	9.5 Disposal by dilution – standards for disposal in different types of water bodies,
	3rd	self purification of stream
	4th	**10.Sewage treatment :** 10.1 Principles of treatment,
	5th	flow diagram of conventional treatment

14th	1st	10.2 Primary treatment – necessity, principles,
	2nd	Essential features, functions of primary treatment
	3rd	10.3 Secondary treatment – necessity, principles, Essential features,
	4th	function of secondary treatment
	5th	**11.Sanitary plumbing for building :** 11.1 Requirements of building drainage, layout of lavatory blocks in
15th	1st	11.2 Plumbing arrangement of single storied & multi storied building as per I.S. code practice
	2nd	11.3 Sanitary fixtures – features, function, and maintenance and fixing of the fixtures, Water closets, flushing cisterns, urinals, Inspection
	3rd	Revision
	4th	Revision
	5th	Revision

Laxmipriya Mohapatra

Signature of Faculty

Discipline-Civil engineering	Semester- 5th	Name Of the teaching Faculty: Er. Pramila Kumari Gouda
Subject- Estimation and Cost Evaluation-II	No. of Days/per week class alloted per week- 4	Semestar From Date : 14/07/2025 To Date:15/11/2025
		No. Of Weeks: 16
Week	**Class Day**	**Theory/Practical Topics**
1st	1st	**CHAPTER-1(Detailed Estimate of culverts and bridges)** Detailed
	2nd	Detailed estimate of a RCC slab Culvert with right angled wing walls
	3rd	Detailed estimate of a RCC slab Culvert with right angled wing walls
	4th	Detailed estimate of a RCC slab Culvert with right angled
2nd	1st	Detailed estimate of a RCC slab Culvert with right angled wing walls
	2nd	Detailed estimate of a RCC slab Culvert with splayed wing walls with
	3rd	Detailed estimate of a RCC slab Culvert with splayed wing walls with
	4th	Detailed estimate of a RCC slab Culvert with splayed wing walls with
3rd	1st	Detailed estimate of a RCC slab Culvert with splayed wing walls with
	2nd	Detailed estimate of a RCC Hume pipe culvert with splayed wing wall
	3rd	Detailed estimate of a RCC Hume pipe culvert with splayed
	4th	Detailed estimate of a RCC Hume pipe culvert with splayed
4th	1st	Detailed estimate of a RCC Hume pipe culvert with splayed
	2nd	**CHAPTER-2(Estimation of Irrigation structures)**Detailed estimate
	3rd	Detailed estimate of simple type of vertical fall to given
	4th	Detailed estimate of simple type of vertical fall to given
	1st	Detailed estimate of simple type of vertical fall to given
5th	2nd	Detailed estimate of simple type of vertical fall to given
	3rd	Detailed estimate of drainage siphon to given specification
	4th	Detailed estimate of drainage siphon to given specification
6th	1st	Detailed estimate of drainage siphon to given specification
	2nd	**CHAPTER-3(Detailed estimate of roads)**Detail estimate of a water
	3rd	Detail estimate of a water bound macadam road
	4th	Detail estimate of a water bound macadam road
7th	1st	Detailed estimate of a flexible pavement in cutting / filling
	2nd	Detailed estimate of a flexible pavement in cutting / filling
	3rd	Detailed estimate of a flexible pavement in cutting / filling
	4th	Detailed estimate of septic tank and soak pit for 50 users
8th	1st	Detailed estimate of septic tank and soak pit for 50 users
	2nd	Detailed estimate of septic tank and soak pit for 50 users
	3rd	**CHAPTER-4(Miscellaneous estimates)**Detailed estimate of Tube well
	4th	Detailed estimate of Tube well
9th	1st	Detailed Estimate of Piles and Pile cap
	2nd	Detailed Estimate of Piles and Pile cap
	3rd	Detailed Estimate of Isolated and combined footings
	4th	Detailed Estimate of Isolated and combined footings
10th	1st	**CHAPTER-5(PWD Accounts works)** Classification of work-original,
	2nd	Concept of Method of execution of works through the contractors and
	3rd	Administrative approval, technical sanction, tender, preparation of
	4th	Earnest money, E-tendering, security deposit, advance payment,
11th	1st	Major & subhead of account, temporary advance (imprest
	2nd	Major & subhead of account, temporary advance (imprest
	3rd	Measurement book use & maintenance, procedure of marking entries of
	4th	Measurement book use & maintenance, procedure of marking entries of
	1st	Muster roll : Its preparation & use for making payment of pay

12th	2nd	Acquittance Roll : Its preparation & use for making payment
	3rd	Labour & labour report, method of labour payment, use of
	4th	Classification of stores, receipt / issue statement on standard form,
13th	1st	Building BYLAWS and REGULATORY Bodies
	2nd	Development authorities, types and their levels, RERA etc
	3rd	Numerical Problems
	4th	Numerical Problems
14th	1st	Numerical Problems
	2nd	Numerical Problems
	3rd	Numerical Problems
	4th	Previous year questions practice
15th	1st	Previous year questions practice
	2nd	Previous year questions practice
	3rd	Previous year questions practice
	4th	Previous year questions practice

Signature of The Faculty

Discipline-Civil Engneering	Semestar- 5th	Name Of the teaching Faculty: Er. Pramila Kumari Gouda
Subject-Estimating Practice-2	No. of Days/per week class alloted:3	Semestar From Date : 14/07/2025 To Date:15/11/2025
		No. Of Weeks:16
Week	**Class Day(3 period day)**	**Theory/Practical Topics**
1st	1st	Detailed estimate of a RCC slab culvert with right angled wing walls with bar bending schedule using MS Excel
2nd	2nd	Detailed estimate of a RCC slab culvert with right angled wing walls with bar bending schedule using MS Excel
3rd	3rd	Detailed Estimate of RCC Hume pipe culvert with splayed angled wing wall using MS Excel
4th	4th	Detailed Estimate of RCC Hume pipe culvert with splayed angled wing wall using MS Excel
5th	5th	Detailed estimate of simple type of vertical fall to given specification using MS Excel
6th	6th	Detailed estimate of simple type of vertical fall to given specification using MS Excel
7th	7th	Detailed estimate of drainage siphon to given specification using MS Excel
8th	8th	Detailed estimate of drainage siphon to given specification using MS Excel
9th	9th	Detail estimate of a water bound macadam road using Excel
10th	10th	Detailed estimate of a flexible pavement in cutting / filling using MS Excel
11th	11th	Detailed estimate of septic tank and soak pit for 50 users using MS Excel
12th	12th	Detailed estimation on tube well using MS Excel
13th	13th	Detailed estimate on piles and pile cap using Ms Excel
14th	14th	Estimation on founation using MS Excel
15th	15th	Estimation on founation using MS Excel

Pramila Kr. Gouda

Signature of The Faculty

Discipline: Civil Engineering	Semester : 5TH	Name of the Teaching Faculty: GF2
Subject :- Civil Engineering Laboratory-II	**No. of Days/ per week class allotted: 6**	**Semester From Date:14/07/2025 To Date 15/11/2025**
		No. of Weeks: 15
Week	**Day(3 periods per day)**	**Practical Topics**
1st	1st	**TESTS ON SOIL** 1.1. Determination of Specific gravity of Soil by Pycnometer/Density bottle.
	2nd	1.2. Determination of Field Density of Soil by Core Cutter Method.
2nd	1st	1.3. Determination of Particle Size gradation of sand/Gravel by sieve analysis.
	2nd	1.4. Wet mechanical analysis using pipette method for clay and silt.
3rd	1st	1.5. (a)Determination of Liquid Limit by soil by Casagrande"s apparatus.
	2nd	(b)Determination of Plastic limit of soil.
4th	1st	1.6. Determination of Shrinkage limit of soil.
	2nd	1.7. Determination of MDD & OMC of soil by using modified Proctor Test.
5th	1st	1.8. Determination of CBR value using Laboratory CBR Testing device.
	2nd	1.9. Determination of c and φ of soil by triaxial testing device.
6th	1st	1.10 Determination of coefficient of permeability of soil by constant head method.
	2nd	**HYRAULICS LABORATORY** 2.1 Verification of Bernoulli's Theorem
7th	1st	2.3 Determination of coefficient of Discharge of a rectangular notch fitted in open Channel.
		2.3 Determination of coefficient of Discharge of a Venturimeter

	2nd	2.3 Determination of coefficient of Discharge of a Venturimeter, Orificemeter fitted in a pipe
8th	1st	2.4. Determination of head Loss due to friction and coefficient of friction for flow through pipe.
	2nd	Determination of head Loss due to friction and coefficient of friction for flow through pipe.
9th	1st	**TRANSPORTATION LABORATORY** 3.1. Penetration Test of Bitumen.
	2nd	3.2. Ductility Test of Bitumen.
10th	1st	3.3. Viscosity Test of Bitumen.
	2nd	3.4 Bitumen content by centrifuge extractor.
11th	1st	Bitumen content by centrifuge extractor.
	2nd	**PUBLIC HEALTH ENGINEERING LABORATORY** 4.1. Determination of Turbidity of water Sample using Turbidimeter.
12th	1st	4.1. Determination of Turbidity of water Sample using Nephlometer.
	2nd	4.1. Determination of Turbidity of water Sample using Jackson's Candle Turbidimeter.
13th	1st	4.2. Determination of pH of Water sample using (a) pH – meter.
	2nd	4.2. Determination of pH of Water sample using (b) colour Comparator.
14th	1st	4.3. Determination of Chloride content of a Water sample using method of titration.
	2nd	4.4. Determination of Coagulant (Alum) dose requirement for a turbid water sample by Jar Test.
15th	1st	4.5. Determination of dissolved oxygen in a water sample.
		4.6. Determination of bacteriological quality of water sample by

	2nd	4.0. Determination of bacteriological quality of water sample by Coliform test.

Signature of the Faculty