LESSON PLAN OF 4TH SEMESTER CIVIL ENGINEERING
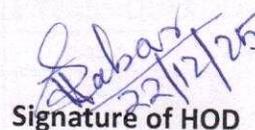
DISCIPLINE :- CIVIL ENGG.	SEMESTER: -4TH	NAME OF THE TEACHING FACULTY:- SWAYAN RANJAN MISRA, LECT. (STAGE-II)		
SUBJECT:- THEORY OF STRUCTURE	No of Days/per Week Class Allotted :- 03	SEMESTER FROM:- 22.12.2025 TO 18.04.2026 SUMMER- 2026 NO OF WEEKS:- 15		

Week	Class Day	Theory Topics
1st	1st	Introduction to axial and eccentric loads, eccentricity about one principal axis only, nature of stresses
	2nd	Maximum and minimum stresses, resultant stresses and distribution diagram.
	3rd	Condition for no tension or zero stress at extreme fiber, Limit of eccentricity
2nd	1st	Core of section for rectangular and circular cross sections, Middle third rule.
	2nd	Chimneys of circular cross section subjected to wind pressure,
	3rd	Maximum and minimum stresses, resultant stresses and distribution diagram at base.
3rd	1st	Analysis of dams subjected to horizontal water pressure, conditions of stability,
	2nd	Maximum and minimum stresses resultant stresses and distribution diagram at base.
	3rd	Concept of slope and deflection, stiffness of beams
4th	1st	Relation among bending moment Slope, deflection and radius of curvature, (no derivation).
	2nd	Double integration method to find slope and deflection of cantilever beams subjected to concentrated load
	3rd	Double integration method to find slope and deflection of Simply Supported Beams subjected to concentrated load
5th	1st	Double integration method to find slope and deflection of cantilever beams subjected to Uniformly Distributed Load.
	2nd	Double integration method to find slope and deflection of Simply Supported Beams subjected to Uniformly Distributed Load.
	3rd	Macaulay's method for slope and deflection, application to cantilever beam subjected to concentrated and uniformly distributed load on entire span.
6th	1st	Macaulay's method for slope and deflection, application to Simply Supported Beam subjected to concentrated and uniformly distributed load on entire span.
	2nd	Concept of Determinate and Indeterminate structures
	3rd	Concept of fixity, effect of fixity, advantages and disadvantages of fixed beam over simply supported beam.

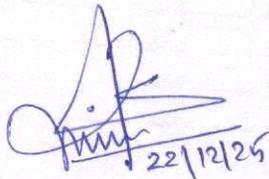|		
7th	1st	Principle of superposition, Fixed end moments from first principle for beam subjected to Point load, UDL over entire span.
	2nd	Application of standard formulae in finding end moments
	3rd	End reactions and drawing S.F. and B.M. diagrams for a fixed beam.
8th	1st	Definition, effect of continuity, nature of moments induced due to continuity, concept of deflected shape, practical examples
	2nd	Clapeyron's theorem of three moment (no derivation), Application of Clapeyron's theorem maximum up to three spans and two unknown support moment only, Support at same level spans having same and uniform moment of inertia subjected to concentrated loads and uniformly distributed loads over entire span.
	3rd	Numerical Problem Solving.
9th	1st	Concept of influence line diagram (ILD)
	2nd	Draw influence line diagram (ILD)
	3rd	Introduction to moment distribution method, sign convention,
10th	1st	Carry over factor
	2nd	Stiffness factor,
	3rd	Distribution factor.
11th	1st	Application of moment distribution method to various types of continuous beams subjected to concentrated loads and uniformly distributed load over entire span having same or different moment of inertia, supports at same level, up to three spans and two unknown support moments only
	2nd	Example problem solving on moment distribution method
	3rd	Example problem solving on moment distribution method .
12th	1st	Example problem solving on moment distribution method
	2nd	Introduction to Portal frame..
	3rd	Symmetrical and unsymmetrical portal frames with the concept of Bays and stories.
13th	1st	Types of Trusses like Simple, Fink, compound fink, French truss
	2nd	Pratt truss, Howe truss, North light truss, King post and Queen post truss
	3rd	Calculate support reactions for trusses subjected to point loads at joints
14th	1st	Calculate forces in members of truss using Method of joints
	2nd	Numerical Problem Solving.
	3rd	Numerical Problem Solving.
15th	1st	Calculate forces in members of truss using Method of Section.
	2nd	Numerical Problem Solving.
	3rd	Numerical Problem Solving.

22/12/25

Signature of Faculty
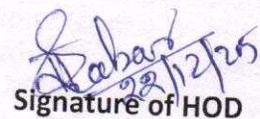
22/12/25

Signature of HOD

LESSON PLAN OF 4ᵀᴴ SEMESTER CIVIL ENGINEERING

DISCIPLINE :- CIVIL ENGG.	SEMESTER: -4TH	NAME OF THE TEACHING FACULTY:- SWAYAN RANJAN MISRA, LECT. (STAGE-II)		
SUBJECT:- DESIGN OF STEEL STRUCTURE	No of Days/per Week Class Allotted :- **03**	SEMESTER FROM:- 22.12.2025 TO 18.04.2026 SUMMER- 2026 NO OF WEEKS:- 15		

Week	Class Day	Theory Topics
1st	1st	Design of connections in steel structures Types of connection, bolted connection
	2nd	Strength of bolted joints
	3rd	Design of bolted joints for axially loaded members
2nd	1st	Numerical Problems on Bolted joints.
	2nd	Types of weld, welded connections
	3rd	Permissible stresses in weld, Strength of weld
3rd	1st	Design of fillet weld for axial load.
	2nd	Numerical problems on Fillet weld
	3rd	Design of butt weld for axial load
4th	1st	Numerical problem on Butt weld
	2nd	Design of Steel Tension (Limit State Method) Types of sections used for Tension members.
	3rd	Strength of tension member by- yielding of section
5th	1st	Strength of tension member by rupture of net cross-section
	2nd	Strength of tension member by block shear.
	3rd	Numerical Problem on Strength of Tension Member.
6th	1st	Numerical Problem on Strength of Tension Member.
	2nd	Design of axially loaded single angle tension members with bolted connections.
	3rd	Numerical Problem on Design of axially loaded single angle tension members with bolted and welded connections.
7th	1st	Design of axially loaded Double angle tension members with bolted connections welded connections.
	2nd	Numerical Problem on Design of axially loaded Double angle tension members with bolted connections welded connections.
	3rd	Design of Steel Compression Members (Limit State Method) Types of sections used as compression member
8th	1st	Calculation of effective length
	2nd	Radius of gyration and slenderness ratio
	3rd	Permissible values of slenderness ratio as per IS 800-2007
9th	1st	Design compressive stress
	2nd	Numerical Problem on Design compressive stress
	3rd	Numerical Problem on Design compressive stress
10th	1st	Introduction to built up sections,
	2nd	lacing and battening (Meaning and purpose)
	3rd	Diagrams of single lacing and battening system. (No numerical problems).

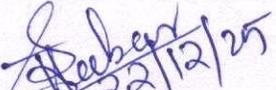| 11th	1st	Diagrams of single lacing and battening system. (No numerical problems).
	2nd	Design of axially loaded single angle struts connected by bolted and welded connections with gusset plate.
	3rd	Design of axially loaded double angle struts connected by bolted and welded connections with gusset plate.
12th	1st	Numerical Problem Design of axially loaded single angle struts connected by bolted and welded connections with gusset plate.
	2nd	Numerical Problem Design of axially loaded Double angle struts connected by bolted and welded connections with gusset plate.
	3rd	Design of Steel beams(Limit State Method) Standard beam sections
13th	1st	Bending stress calculations.
	2nd	Design of simple I Section
	3rd	Design of simple channel section.
14th	1st	Check for shear as per IS 800 2007
	2nd	Numerical Problem on Design of Beam
	3rd	Introduction to plate girder
15th	1st	Simple and built up sections
	2nd	Introduction to plate girder
	3rd	Components and functions of Plate Girder. (no numerical)

22/12/25

Signature of Faculty

22/12/25

Signature of HOD

LESSON PLAN OF 4TH SEMESTER CIVIL ENGINEERING

DISCIPLINE :- CIVIL ENGG.	SEMESTER: -4TH	NAME OF THE TEACHING FACULTY:- **MISS JYOTIRMAYEE SABAR, SENIOR LECTURER**
SUBJECT:- ESTIMATING, COSTING & VALUATION **CEPC206 TH:3**	No of Days/per Week Class Allotted :- **03**	SEMESTER FROM:- <u>**22.12.2025 TO 18.04.2026**</u> **SUMMER 2026** NUMBER OF WEEKS:- **15**

Week	Class Day	Theory Topics
1st	1st	**UNIT-I** **Fundamentals of Estimating and Costing** Estimating and Costing – Meaning, purpose, administrative approval, Technical Sanction
	2nd	Types of methods of estimates – Approximate and Detailed estimate.
	3rd	Roles and responsibility of Engineers at different positions/levels, administrative set ups and heirarchy of Engineering Dept. in State Govt./Central Govt./PSUs
2nd	1st	Standard formats of Measurement sheet, Abstract sheet,
	2nd	Modes of measurement and desired accuracy in measurements for different items of work as per IS:1200.
	3rd	Rules for deduction in different category of work as per IS:1200.
3rd	1st	Description / specification of items of building work as per OPWD /DSR. /CPWD/Railways
	2nd	Description / specification of items of building work as per OPWD /DSR. /CPWD/Railways
	3rd	**UNIT-II** **Detailed Estimate** Detailed Estimate- Definition and Purpose, Data required for detailed estimate - Civil cost, GST, Contingencies, Supervision charges, Procedure for preparation of detailed estimate
4th	1st	Long wall and Short wall method, Centre line method.
	2nd	Bar bending schedule for footing, column, beam, Lintel, chajja and slab elements
	3rd	Bar bending schedule for footing, column, beam, Lintel, chajja and slab elements
5th	1st	Bar bending schedule for footing, column, beam, Lintel, chajja and slab elements
	2nd	Bar bending schedule for footing, column, beam, Lintel, chajja and slab elements
	3rd	Provisions in detailed estimate: contingencies, work charged establishent, percentage charges, water supply and sanitary Charges and electrification charges etc.
6th	1st	Prime cost, Provisional sum, Provisional quantities, Bill of quantities, Spot items or Site items.
	2nd	Detailed estimate of residential buildings using long wall short wall and centre line method
	3rd	Detailed estimate of residential buildings using long wall short wall and centre line method
7th	1st	Detailed estimate of residential buildings using long wall short wall and centre line method
	2nd	Detailed estimate of residential buildings using long wall short wall and centre line method
	3rd	Detailed estimate of residential buildings using long wall short wall and centre line method
8th	1st	Detailed estimate of residential buildings using long wall short wall and centre line

		method
	2nd	Detailed estimate of residential buildings using long wall short wall and centre line method
	3rd	**UNIT-III** **Estimate for Civil Engineering Works** Earthwork - Quantities for roads, Embankment and canal by – Mid sectional area method, mean sectional area method, Prismoidal and trapezoidal formula method.
9th	1st	Earthwork - Quantities for roads, Embankment and canal by – Mid sectional area method, mean sectional area method, Prismoidal and trapezoidal formula method.
	2nd	Earthwork - Quantities for roads, Embankment and canal by – Mid sectional area method, mean sectional area method, Prismoidal and trapezoidal formula method.
	3rd	Earthwork - Quantities for roads, Embankment and canal by – Mid sectional area method, mean sectional area method, Prismoidal and trapezoidal formula method.
10th	1st	Detailed estimate for septic tank,
	2nd	Detailed estimate for septic tank,
	3rd	Estimate of RCC culvert, drainage syphon and vertical fall
11th	1st	Estimate of RCC culvert, drainage syphon and vertical fall
	2nd	Estimate of RCC culvert, drainage syphon and vertical fall
	3rd	Estimate of RCC culvert, drainage syphon and vertical fall
12th	1st	Estimate of Bituminous Road
	2nd	Estimate of Bituminous Road
	3rd	**UNIT-IV** **Rate Analysis** Rate Analysis: Definition, purpose and importance. Lead (Standard and Extra), lift, overhead charges, water charges and contractors' profit, procedure for rate analysis.
13th	1st	Task work- Definition, types. Task work of different skilled labour for different items.
	2nd	Categories of labours, their daily wages, types and number of labours for different items of work.
	3rd	Transportation charges of materials - Lead and Lift, Hire charges of machineries and equipment.
14th	1st	Preparing rate analysis of different items of work pertaining to buildings and roads. (Different items of work like PCC, Plastering, Flooring, and Brick work)
	2nd	Preparing rate analysis of different items of work pertaining to buildings and roads. (Different items of work like PCC, Plastering, Flooring, and Brick work)
	3rd	Preparing rate analysis of different items of work pertaining to buildings and roads. (Different items of work like PCC, Plastering, Flooring, and Brick work)
15th	1st	Preparing rate analysis of different items of work pertaining to buildings and roads. (Different items of work like PCC, Plastering, Flooring, and Brick work)
	2nd	Preparing rate analysis of different items of work pertaining to buildings and roads. (Different items of work like PCC, Plastering, Flooring, and Brick work)
	3rd	**REVISION, PREVIOUS YEAR QUESTION ANSWER DISCUSSION**
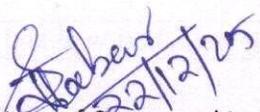
Signature of Concerned Lecturer   Signature of HOD

LESSON PLAN OF 4TH SEMESTER CIVIL ENGINEERING

Discipline :- CIVIL	Semester :-4th	Name of the Teaching Faculty:- ASHOK KUMAR RANA , Lect.(stage-I)		
Subject: Construction Management	No of Days/per Week Class Allotted :- 03	Semester From:- 22nd Dec, 2025 To:- 18th Apr, 2026 (SUMMER 2026) No of Weeks:- 15		

Week	Class Day	Theory Topics
1st	1st	**Construction industry and management-** Organization-objectives, principles of organization
	2nd	types of organization: government/public and private construction industry
	3rd	Role of various personnel in construction organization
2nd	1st	Agencies associated with construction work- owner, promoter, builder, designer, architects
	2nd	Role of consultant for various activities: Preparation of Detailed Project Report (DPR)
	3rd	monitoring of progress and quality, settlement of disputes
3rd	1st	**Site Layout** - Principles governing site layout
	2nd	Principles governing site layout
	3rd	Factors affecting site layout
4th	1st	Factors affecting site layout
	2nd	Preparation of site layout
	3rd	Preparation of site layout
5th	1st	Land acquisition procedures and providing compensation
	2nd	Land acquisition procedures and providing compensation
	3rd	**Planning and scheduling-** Identifying broad activities in construction work & allotting time to it
6th	1st	Methods of Scheduling
	2nd	Development of bar charts, Merits & limitations of bar chart
	3rd	Elements of Network: Event, activity
7th	1st	dummy activities, Precautions in drawing Network, Numbering the events
	2nd	CPM networks, activity time estimate
	3rd	Event Times by forward & backward pass calculation
8th	1st	start and finish time of activity, project duration
	2nd	Floats: Types of Floats-Free, independent and total floats
	3rd	critical activities and critical path
9th	1st	Purpose of crashing a network, Normal Time and Cost, Crash Time and Cost
	2nd	Cost slope, Optimization of cost and duration
	3rd	Material Management- Ordering cost, inventory carrying cost, Economic Order Quantity
10th	1st	Store management, various records related to store management, inventory control by ABC technique

	2ⁿᵈ	Introduction to material procurement through portals
	3ʳᵈ	**Construction Contracts and Specifications**-Types of Construction contracts
11ᵗʰ	1ˢᵗ	Types of Construction contracts
	2ⁿᵈ	Contract documents
	3ʳᵈ	specifications
12ᵗʰ	1ˢᵗ	general special conditions
	2ⁿᵈ	Contract Management
	3ʳᵈ	procedures involved in arbitration and settlement
13ᵗʰ	1ˢᵗ	procedures involved in arbitration and settlement
	2ⁿᵈ	**Safety in Construction** - Safety in Construction Industry
	3ʳᵈ	Safety in Construction Industry
14ᵗʰ	1ˢᵗ	Causes of Accidents, Remedial and Preventive Measures
	2ⁿᵈ	Causes of Accidents, Remedial and Preventive Measures
	3ʳᵈ	Labour Laws and Acts pertaining to Civil construction activities
15ᵗʰ	1ˢᵗ	Labour Laws and Acts pertaining to Civil construction activities
	2ⁿᵈ	Labour Laws and Acts pertaining to Civil construction activities
	3ʳᵈ	Labour Laws and Acts pertaining to Civil construction activities
		DOUBT CLEARING CLASS AND REVISION & PREVIOUS FIVE YEARS QUESTION ANSWER DISCUSSION

Signature of Lecturer
22.12.

Signature of H.O.D
22/12/25

LESSON PLAN OF 4TH SEMESTER CIVIL ENGINEERING

Discipline :- CIVIL	Semester :-4th	Name of the Teaching Faculty:- ASHOK KUMAR RANA , Lect (stage-I)
Subject: Hydraulics & Irrigation Engg	No of Days/per Week Class Allotted :- 03	Semester From:- 22nd Dec, 2025 To:- 18th Apr, 2026 (SUMMER 2026) No of Weeks:- 15

Week	Class Day	Theory Topics
1st	1st	**Pressure measurement and Hydrostatic pressure** -Technical terms used in Hydraulics – fluid, fluid mechanics, hydraulics, hydrostatics and hydrodynamics - ideal and real fluid, application of hydraulics. Physical properties of fluid – density-specific volume, specific gravity, surface tension, capillarity, viscosity-Newton's law of viscosity
	2nd	Various types of pressure – Atmospheric Pressure, Gauge Pressure, Absolute Pressure, Vacuum Pressure. Concept of Pressure head and its unit, Pascal's law of fluid pressure and its uses. Measurement of differential Pressure by different methods
	3rd	Variation of pressure with depth, Pressure diagram, hydrostatic pressure and center of pressure on immersed surfaces and on tank walls. Determination of total pressure and center of pressure on sides and bottom of water tanks, sides and bottom of tanks containing two liquids, vertical surface in contact with liquid on either side
2nd	1st	**Fluid Flow Parameters** Types of flow – Gravity and pressure flow, Laminar, Turbulent, Uniform, Non-uniform, Steady, Unsteady flow. Reynolds number. Discharge and its unit, continuity equation of flow
	2nd	Energy of flowing liquid: potential, kinetic and pressure energy. Bernoulli's theorem : statement, assumptions, equation
	3rd	**Flow through pipes** Major head loss in pipe: Frictional loss and its computation by Darcy's Weisbach equation
3rd	1st	Minor losses in pipe: loss at entrance, exit, sudden contraction, sudden enlargement and fittings
	2nd	Flow through pipes in series, pipes in parallel and Dupuit's equation for equivalent pipe
	3rd	Hydraulic gradient line and total energy line
4th	1st	Discharge measuring device for pipe flow: Venturi meter - construction and working
	2nd	Discharge measurement-using Orifice
	3rd	Hydraulic Coefficients of Orifice
5th	1st	**Flow through Open Channel** Geometrical properties of channel section: Wetted area, wetted perimeter, hydraulic radius for rectangular and trapezoidal channel section
	2nd	Determination of discharge by Chezy's equation and Manning's equation.
	3rd	Conditions for most economical rectangular and trapezoidal channel section
6th	1st	Discharge measuring devices: Triangular and rectangular Notches
	2nd	Velocity measurement devices: current meter
	3rd	Velocity measurement devices: floats and Pitot's tube
7th	1st	Specific energy diagram, Froudes' Number

	2nd	**Hydraulic Pumps** Concept of pump, Types of pump - centrifugal, reciprocating, submersible
	3rd	Centrifugal pump: components and working
8th	**1st**	Reciprocating pump: single acting and double acting, components and working
	2nd	Suction head, delivery head, static head, Manometric head
	3rd	Power of centrifugal pump, Selection and choice of pump
9th	**1st**	**Introduction to Hydrology** Hydrology: Definition and Hydrological cycle, Rain Gauge: Symons rain gauge, automatic rain gauge
	2nd	Methods of calculating average rainfall: Arithmetic mean, Isohyetal, and Theissen polygon method
	3rd	Runoff, Factors affecting Run off, Computation of run–off
10th	**1st**	Maximum Flood Discharge measurement: Rational and empirical methods, Simple numerical problems
	2nd	Yield and Dependable yield of a catchment, determination of dependable yield
	3rd	**Crop water requirement and Reservoir Planning** Irrigation and its classification
11th	**1st**	Crop Water requirement: Cropping seasons, Crop period, base period, Duty, Delta, CCA, GCA, intensity of irrigation, factors affecting duty, Problems on water requirement and capacity of canal
	2nd	Methods of application of irrigation water and its assessment. Area capacity curve
	3rd	Silting of reservoir, Rate of silting, factors affecting silting and control measures
12th	**1st**	Control levels in reservoir, Simple numerical problems on Fixing Control levels .
	2nd	**Dams and Spillways Dams and its classification**: Earthen dams and Gravity dams (masonry and concrete).
	3rd	Earthen Dams – Components with function, typical cross section, seepage through embankment and foundation and its control.
13th	**1st**	Methods of construction of earthen dam, types of failure of earthen dam and preventive measures .
	2nd	Gravity Dams – Forces acting on dam, Theoretical and practical profile, typical cross section, drainage gallery, joints in gravity dam, concept of high dam and low dam
	3rd	Spillways-Definition, function, location, types and components, Energy dissipaters
14th	**1st**	**Diversion Head Works & Canals Weirs** – components, parts, types, K.T. weir – components and construction
	2nd	Diversion head works – Layout, components and their function
	3rd	Barrages – components and their functions. Difference between weir and Barrage
15th	**1st**	Canals – Classification according to alignment and position in the canal network, Cross section of canal in embankment and cutting, partial embankment and cutting, balancing depth, Canal lining - Purpose, material used and its properties, advantages
	2nd	Cross Drainage works- Aqueduct, siphon aqueduct, super passage, level crossing
	3rd	Canal regulators- Head regulator, Cross regulator, Escape, Falls and Outlets
		DOUBT CLEARING CLASS AND REVISION & PREVIOUS FIVE YEARS QUESTION ANSWER DISCUSSION

Signature of Lecturer
22.12.2025

Signature of H.O.D
22/12/25