LESSON PLAN OF 5th SEMESTER CIVIL ENGINEERING

Discipline: - CIVIL	Semester : -5th	Name of the Teaching Faculty: - SWAYAN RANJAN MISRA, LECT. STAGE-II
Subject: Design of RCC CEPC303 TH:2	No of Days/per Week Class Allotted: - 03	Semester From: -1th July, 2026 to: - 05th Nov, 2026 (WINTER 2026) No of Weeks: - 15

Week	Class Day	Theory Topics
1st	1st	**Design Philosophies, Shear, Bond and Development length in Design of RCC member** Design Philosophies, Design of Singly Reinforced & Doubly Reinforced beam for Flexure using LSM
	2nd	Nominal shear stress in RCC section, Design shear strength of concrete
	3rd	Design of shear reinforcement
2nd	1st	Minimum Shear Reinforcement, Provisions of IS 456 2000, forms of shear reinforcement
	2nd	Provisions of IS 456 2000, forms of shear reinforcement
	3rd	Types of bonds, Bond stress
3rd	1st	Check for bond stress
	2nd	Check as per codal provisions, Anchorage value of 90o hook, Lapping of bars.
	3rd	Simple numerical on: Shear reinforcement
4th	1st	Adequacy of section for shear.
	2nd	Introduction to serviceability limit state check
	3rd	**Design of axially loaded RCC Column** Definition and classification of column
5th	1st	Limit state of compression members
	2nd	Effective length of column
	3rd	Provisions of IS 456 2000 for minimum steel, cover, maximum steel, spacing of ties etc.
6th	1st	Design of axially loaded short column - Square
	2nd	Design of axially loaded short column - Rectangular
	3rd	Design of axially loaded short column - Circular
7th	1st	Numerical Problem on Compression member.
	2nd	**Design of RC flanged beam** General features of T and L beams
	3rd	Advantages, Effective width as per BIS 456 2000
8th	1st	Design of singly reinforcement T beam, Stress and Strain diagram, Depth of neutral axis,
	2nd	Moment of resistance, T and L beams with neutral axis in flange only
	3rd	Simple numerical on location of neutral axis
9th	1st	Effective width of flange

	2nd	**Design of slab** Design of simply supported one-way slab for flexure
	3rd	Design of simply supported one-way slab for Shear
10th	1st	Design of simply supported one-way slab for Deflection
	2nd	Checks as per the provisions of BIS 456
	3rd	Design of one-way cantilever slab for Flexure.
11th	1st	Design of one-way cantilever Chajjas for Flexure.
	2nd	Checks for Development length and Shear stress.
	3rd	Design of two-way simply supported slab
12th	1st	Design of two-way simply supported slab
	2nd	Numerical Problems on Two-way Slab.
	3rd	**Design of Footing** Design of footing for axially loaded column
13th	1st	Design of footing for axially loaded column
	2nd	Design of footing for axially loaded column
	3rd	Minimum Eccentricity
14th	1st	Design of Footing for uni-axial bending
	2nd	Design of Footing for uni-axial bending
	3rd	Design of Footing for uni-axial bending
15th	1st	Column with uni- axial moment as per IS 456 provisions.
	2nd	Column with uni- axial moment as per IS 456 provisions.
	3rd	Numerical Problems
		DOUBT CLEARING CLASS AND REVISION & PREVIOUS FIVE YEARS QUESTION ANSWER DISCUSSION

Signature of Lecturer

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LESSON PLAN OF 5TH SEMESTER CIVIL ENGINEERING		
DISCIPLINE: -CIVIL ENGG.	SEMESTER: - 5TH	NAME OF THE TEACHING FACULTY: - **SRI SWAYAN RANJAN MISRA**
SUBJECT: PROFESSIONAL SKILLS **OE 301C** **TH:5**	No of Days/per Week Class Allotted: -03	SEMESTER FROM: - **1ST JULY 2026 TO 5TH NOV 2026** - WINTER 2026 NUMBER OF WEEKS: - **15**

Week	Class Day	Theory Topics
1st	1st	**UNIT I Communication Skills** Active listening
	2nd	Verbal communication
	3rd	Non-verbal communication
2nd	1st	Written communication
	2nd	Presentation skills
	3rd	Presentation skills
3rd	1st	Conflict resolution
	2nd	Conflict resolution
	3rd	**UNIT II** Teamwork **and Collaboration** Building trust within a team
4th	1st	Building trust within a team
	2nd	Effective collaboration strategies
	3rd	Effective collaboration strategies
5th	1st	Role delegation and responsibility sharing
	2nd	Role delegation and responsibility sharing
	3rd	Conflict resolution within a team
6th	1st	Conflict resolution within a team
	2nd	**UNIT III** Problem-**Solving** Identifying root causes of issues
	3rd	Identifying root causes of issues
7th	1st	Generating solutions and evaluating options

	2nd	Generating solutions and evaluating options
	3rd	Decision-making under pressure
8th	1st	Decision-making under pressure
	2nd	Critical thinking skills
	3rd	Triple constraint issues
9th	1st	**UNIT IV Time Management** Prioritization and task management
	2nd	Prioritization and task management
	3rd	Setting realistic deadlines
10th	1st	Setting realistic deadlines
	2nd	Effective time planning and organization
	3rd	Effective time planning and organization
11th	1st	**UNIT V Emotional Intelligence** Self-awareness and emotional regulation
	2nd	Empathy and understanding others' emotions
	3rd	Empathy and understanding others' emotions
12th	1st	Managing interpersonal relationships
	2nd	Motivation
	3rd	Social skills
13th	1st	Emotional Intelligence (EQ)
	2nd	Stress management
	3rd	**UNIT VI Professional Ethics and Integrity** Workplace ethics and code of conduct
14th	1st	Workplace ethics and code of conduct
	2nd	Confidentiality and data privacy
	3rd	Confidentiality and data privacy
15th	1st	Professional accountability
	2nd	Professional accountability
	3rd	Important Considerations

Signature of Lecturer

Signature of HOD

LESSON PLAN OF 5th SEMESTER CIVIL ENGINEERING

Discipline :- CIVIL	Semester :-5th	Name of the Teaching Faculty: - SWAYAN RANJAN MISRA, LECT. STAGE-II
Subject: Design of RCC Lab CEPC 309 PR-3	No of Days/per Week Class Allotted: - 04	Semester from: -1th July, 2026 To: - 05th Nov, 2026 (WINTER 2026) No of Weeks:- 15

Week	Class Day	Practical Topics
1st	1st	Introduction to CAD interface, layers, units, and structural drafting standards. Drawing the longitudinal section and cross-section of a Singly Reinforced Beam
	2nd	Plotting the strain and stress distribution diagrams for limit state design. Dimensioning, labeling, and detailing reinforcement bars
2nd	1st	Setting up drawing parameters for a Doubly Reinforced Beam Drafting the longitudinal section and cross-section of DRB in AutoCAD.
	2nd	Plotting the strain and equivalent stress block diagrams for DRB. Detailing tension, compression, and shear reinforcement for DRB with standard bar callouts.
3rd	1st	Layout presentation, text styles, title block preparation, and plotting/exporting to PDF. Final verification of drawings, viva-voce, and submission of Practical 1.
	2nd	Introduction to shallow foundations: types, codal provisions, and drafting conventions. Drafting plan and cross-sectional elevation of an Isolated Square Footing.
4th	1st	Drafting plan and sectional elevation of an Isolated Rectangular / Sloped Footing. Detailing reinforcement mesh and column dowel / starter bars for isolated footings.
	2nd	Drafting plan and elevation of Combined Footing
5th	1st	Drafting reinforcement detailing of Combined Footing
	2nd	Bar bending arrangements, cover to reinforcement, and development length in footings. Final sheet drafting, title block compilation, and submission of Practical 2.
6th	1st	Introduction to site engineering drawings: legend, notes, standard abbreviations, and grid lines. Reading foundation layout drawings and column schedule (size, cover, main bars, ties).
	2nd	Interpreting column lap locations, crank details, and curtailment rules. Reading Plinth Beam and Floor Beam structural framing plans.
7th	1st	Interpreting beam schedules, L/3 & L/4 curtailment, top extra bars, and shear stirrup zones. Reading one-way and two-way slab layouts, main steel, distribution steel, and chair bars.
	2nd	Interpreting Staircase longitudinal sections (waist slab, landings, flight reinforcement, re-entrant corners). Reading retaining wall / underground sump reinforcement details.
8th	1st	Cross-verifying Bar Bending Schedule (BBS) tables with structural drawing profiles. Practical evaluation, viva-voce on drawing interpretation, and submission of Practical 3.

	2nd	Fundamentals of quality assurance, IS codal tolerances, and checklist preparation. Preparing inspection checklist for Footing and Pedestal reinforcement (cover, spacing, dowels).
9th	1st	Preparing checklist for Column reinforcement (verticality, lap length, lateral tie spacing/hooks). Preparing checklist for Beam reinforcement (cover blocks, top/bottom bars, stirrup spacing, side face steel).
	2nd	Preparing checklist for Slab reinforcement (effective depth, top mesh support/chairs, edge anchorage). Preparing checklist for Staircase reinforcement (waist slab thickness, rebar continuity at kinks).
10th	1st	Preparing pre-concreting checklist (cleanliness, cover block placement, binding wire ties, embedded conduits). Standardizing rejection criteria and non-conformance reporting (NCR) format.
	2nd	Case study exercises: auditing sample site drawings against prepared checklists. Finalizing comprehensive site inspection checklist sheets and Practical 4 submission.
11th	1st	Pre-visit briefing: site safety guidelines (PPE), objectives, and field measurement tools. **Site Visit Session 1:** Inspection of Footing and Column reinforcement execution on-site.
	2nd	**Site Visit Session 2:** Observation of Beam and Slab rebar bending, cover blocks, and laps. **Site Visit Session 3:** Inspection of Staircase reinforcement, flight-landing junctions, and formwork.
12th	1st	Field data collection: bar diameters, actual c/c spacing, hook angles (135°), and lap lengths. Comparing observed field practices with standard structural drawings and codal specifications.
	2nd	Drafting Report Section 1: Introduction, methodology, and footing/column observations. Drafting Report Section 2: Beam, slab, and staircase detailing with field sketches and photos.
13th	1st	Compiling findings, observed deviations, corrective actions, and conclusions. Final report binding, student presentations, viva, and Practical 5 submission.
	2nd	Introduction to STAAD-Pro GUI, coordinate systems, node/member generation, and units. Modelling a Simply Supported RCC Beam: defining nodes, beam elements, and geometry.
14th	1st	Assigning concrete material properties and cross-sectional dimensions Applying boundary conditions (supports: pinned, fixed, roller) to the beam model.
	2nd	Defining and assigning load cases: Dead Load (self-weight), Superimposed Dead Load, and Live Load. Creating load combinations as per IS 456 (1.5(DL} +{LL})
15th	1st	Running static analysis and viewing output: Shear Force Diagram (SFD) and Bending Moment Diagram (BMD). Concrete design module setup: assigning design code (IS 456), concrete grade, and steel grade.
	2nd	Performing RCC design run and extracting longitudinal & shear reinforcement output tables. Exporting analysis/design reports, software viva-voce, and final lab record submission.

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LESSON PLAN OF 3rd SEMESTER CIVIL ENGINEERING

Discipline: - CIVIL	Semester : -3rd	Name of the Teaching Faculty: -
Subject: **Mechanics of Material** CEPC205 TH:3	No of Days/per Week Class Allotted: - 03	Semester From: - **01.07.2026 TO 05.11.2026** **WINTER 2026** No of Weeks: - **15**

Week	Class Day	Theory Topics
1st	1st	**Centre of Gravity and Moment of Inertia** Definition of center of gravity -Centre of gravity of Symmetrical shapes (solid / hollow square, rectangular section
	2nd	Centre of gravity of circular, I Sections. Numerical problem solving
	3rd	**Moment of inertia (M.I.)**: Definition, M.I. of plane lamina, Radius of gyration, section modulus, Parallel and Perpendicular axes theorems
2nd	1st	M.I. of rectangle, square, circle, semicircle, quarter circle and triangle section
	2nd	M.I. of symmetrical and unsymmetrical I-section, Channel section,
	3rd	M.I. of T-section, Angle section, Hollow sections
3rd	1st	M.I. of built-up sections about centroidal axes and any other reference axis.
	2nd	Polar Moment of Inertia of solid circular sections
	3rd	**Simple Stresses and Strains** Definition of rigid, elastic and plastic bodies, deformation of elastic body under various forces.
4th	1st	Definition of stress, strain, elasticity, Hook's law, Elastic limit, Modulus of elasticity
	2nd	**Type of Stresses** Normal, Direct, Bending and Shear and nature of stresses i.e. Tensile and Compressive stresses.
	3rd	Standard stress strain curve for tor steel bar under tension, Yield stress, Proof stress, Ultimate stress, Strain at various critical points, Percentage elongation and Factor of safety.
5th	1st	Deformation of body due to axial force, forces applied at intermediate sections
	2nd	Maximum and minimum stress induced Composite section under axial loading.
	3rd	Concept of temperature stresses and strain
6th	1st	Stress and strain developed due to temperature variation in homogeneous simple bar
	2nd	Longitudinal and lateral strain, Modulus of Rigidity, Poisson's ratio, Bulk modulus
	3rd	Biaxial and tri-axial stresses, volumetric strain, change in volume, Relation between modulus of elasticity, modulus of rigidity and bulk modulus
7th	1st	**Principal stresses and strains:** Occurrence of normal and tangential stresses, Concept of Principal stress and Principal Planes, major and minor principal stresses and their orientations.
	2nd	stresses on a given plane –shear and normal stress components on any inclined plane – Mohr's circle and its use in solving problems on complex stresses - Numerical problems

	3rd	**Shear Force and Bending Moment** Types of supports, beams and loads
8th	1st	Concept and definition of shear force and bending moment, Relation between load, shear force and bending moment
	2nd	Shear force diagram for cantilever beams subjected to point loads
	3rd	bending moment diagram for cantilever beams subjected to point loads
9th	1st	Shear force diagram for cantilever beams subjected to Uniformly distributed load.
	2nd	Bending moment diagram for cantilever beams subjected to Uniformly distributed load.
	3rd	Shear force diagram for simply supported beams subjected to point loads
10th	1st	Bending moment diagram for simply supported beams subjected to point loads
	2nd	Shear force diagram for simply supported beams subjected Uniformly distributed load
	3rd	Bending moment diagram for simply supported beams subjected to Uniformly distributed load
11th	1st	Shear force and bending moment diagram for cantilever and simply supported beams subjected to couple and combination of any two types of loading, point of contra flexure.
	2nd	**Bending and Shear Stresses in beams** Concept and theory of pure bending, assumptions, flexural equation
	3rd	bending stresses and their nature, bending stress distribution diagram
12th	1st	Concept of moment of resistance and simple numerical problems using flexural equation.
	2nd	Concept of moment of resistance and simple numerical problems using flexural equation
	3rd	Shear stress equation
13th	1st	Relation between maximum and average shear stress for rectangular and circular section, shear stress distribution diagram.
	2nd	Shear stress distribution for square, rectangular, circle,
	3rd	Shear stress distribution for angle sections, channel section, I-section, T section
14th	1st	Simple numerical problems based on shear equation.
	2nd	**Columns** Concept of compression member, short and long column, Effective length, Radius of gyration
	3rd	Slenderness ratio, Types of end condition for columns, Buckling of axially loaded columns
15th	1st	Euler's theory, assumptions made in Euler's theory and its limitations
	2nd	Application of Euler's equation to calculate buckling load.
	3rd	Rankine' s formula and its application to calculate crippling load, Concept of working load/safe load, design load and factor of safety
		DOUBT CLEARING CLASS AND REVISION & PREVIOUS FIVE YEARS QUESTION ANSWER DISCUSSION

Signature of Lecturer

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LESSON PLAN OF 3rd SEMESTER CIVIL ENGINEERING

Discipline :- CIVIL	Semester :-3rd	Name of the Teaching Faculty: - SWAYAN RANJAN MISRA, LECT. STAGE-II
Subject: Mechanics of Material Lab CEPC 213 PR-2	No of Days/per Week Class Allotted: - 04	Semester from: -1th July, 2026 To: - 05th Nov, 2026 (WINTER 2026) No of Weeks:- 15

Week	Class Day	Practical Topics
1st	1st	Introduction to Strength of Materials Laboratory; Lab safety protocols and standard precautions. Study of Universal Testing Machine (UTM): Parts, loading mechanism, controls, and extensometer.
	2nd	Study of UTM: Hydraulic system, load pacing, data acquisition, and calibration checks. Specimen preparation, gauge length marking, and initial dimensional measurements of Mild Steel bar.
2nd	1st	Conducting Tension Test on Mild Steel as per IS: 432(1) – Setup, gripping, and initial loading. Observation of yield point, ultimate load, breaking load, and necking phenomenon on Mild Steel.
	2nd	Calculation of yield stress, ultimate tensile stress, percentage elongation, and reduction of area. Plotting and analysis of the Stress vs. Strain curve; determination of Young's Modulus (E).
3rd	1st	Cold Bend and Re-bend test on Mild Steel specimen as per relevant Indian Standards. Observation of surface cracks/fracture after bending; Viva-voce and lab report verification.
	2nd	Introduction to Tor Steel/HYSD bars; Comparison of mechanical behavior with Mild Steel (IS: 1608/IS: 1139). Specimen measurement, calculation of cross-sectional area by mass per meter run method.
4th	1st	Setup and gauge marking of Tor Steel specimen on the Universal Testing Machine. Execution of Tension Test on Tor Steel; Monitoring load vs. elongation data points.
	2nd	Determination of 0.2% Proof Stress using the offset method from experimental data. Calculation of Ultimate Tensile Strength (UTS), Total Elongation, and UTS/Yield ratio.
5th	1st	Plotting and comparison of stress-strain graphs between Mild Steel and Tor Steel. Conducting standard Bend test on Tor Steel specimen around specified mandrel diameter.
	2nd	Conducting Reverse Bend (Re-bend) test on Tor Steel specimen; visual inspection for flaws. Result analysis, error discussion, viva-voce, and lab record evaluation for Practical 2.
6th	1st	Introduction to toughness, impact resistance, and brittle-to-ductile transition in metals. Study and constructional details of Pendulum-type Impact Testing Machine.
	2nd	Preparation and notch dimensional verification of Izod test specimens (IS: 1598). Performing Izod Impact Test on Mild Steel and Cast Iron specimens; recording energy absorbed.
7th	1st	Performing Izod Impact Test on Non-Ferrous metals (Aluminium/Brass/Copper). Comparative evaluation of Izod impact values across ferrous and non-ferrous specimens.
	2nd	Study of Charpy Impact test setup, striking edge geometry, and specimen placement (IS: 1757). Performing Charpy Impact Test on Mild Steel and Cast Iron specimens.

8th	1st	Performing Charpy Impact Test on Aluminium/Brass/Copper specimens. Comparison of Izod vs. Charpy results; fracture surface analysis (ductile vs. cleavage); record check.
	2nd	Introduction to brick testing standards (IS: 3495 Parts I & II, IS: 1077); Visual inspection and sampling. Measurement of brick dimensions; Pre-conditioning and oven drying of brick samples for Water Absorption test.
9th	1st	Determining dry weight (W_1); Immersion of brick samples in cold water for 24 hours. Taking wet weight (W_2), calculation of 24-hour water absorption percentage, and grading of bricks.
	2nd	Preparation of brick specimens for Compressive Strength test (frog filling with 1:3 cement mortar). Curing of mortar-filled brick specimens in water for 24 hours.
10th	1st	Testing of Dry Bricks under Compression Testing Machine (CTM) with plywood packing. Testing of Wet/Saturated Bricks under CTM; Recording peak failure loads.
	2nd	Calculation of Compressive Strength (N/\text{mm}^2) for dry and wet brick samples. Classification of bricks based on strength criteria; Report preparation and viva-voce.
11th	1st	Introduction to standard concrete testing procedures and importance of curing. Study of Compression Testing Machine (CTM): Load range selection, pacing rate, and spherical seating.
	2nd	Dimensional measurement, weight determination, and density calculation of concrete cubes. Execution of Compression Test on Concrete Cubes (7-day / 28-day cured specimens).
12th	1st	Calculation of characteristic compressive strength; Evaluation of failure modes and crack patterns. Introduction to flexural tensile strength (Modulus of Rupture) of concrete as per IS standards.
	2nd	Specimen inspection and marking of symmetrical two-point/central loading points on rectangular concrete beam. Setup of concrete beam on flexural testing assembly with roller supports.
13th	1st	Application of load until failure; Recording ultimate load and crack distance from nearest support. Calculation of Modulus of Rupture (f_{cr}); Comparative evaluation and lab record submission.
	2nd	Introduction to tile specifications (IS: 1237 / relevant IS codes) and sampling techniques. Visual inspection, dimensional tolerance, flatness, and thickness measurement of tile samples.
14th	1st	Study of tile flexural testing apparatus (support span setup and loading rollers). Execution of Flexural Strength (Wet Transverse Strength) test on floor tiles.
	2nd	Execution of Flexural / Breaking load test on roof tiles; Calculation of breaking load per unit width. Introduction to Tile Abrasion Testing Machine (Böhme / Friction Disc apparatus) and artificial abrasive grit.
15th	1st	Specimen preparation, initial dry weight, and initial thickness measurement for abrasion test. Execution of Abrasion Test for specified grinding revolutions (cycles).
	2nd	Post-test specimen cleaning, final thickness loss measurement, and loss of volume calculation. Comprehensive performance evaluation of tiles; Final lab record checking, grading, and internal viva.

Signature of Lecturer

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