Lesson Plan for Building Services and Maintenance (Code NO. :- CEPE301 TH:3) Winter-2026-27

Discipline	Semester	Name of the teaching faculty
Civil Engineering	5TH	Rajesh Kumar Pradhan, Guest Faculty (Civil Engineering)
Subject: Building Services and Maintenance (TH:-3)		No. of days per Week classes are alloted: 03
Total No. of weeks-15 weeks		Semester Duration: 20-07-2026 to 05-11-2026

Weeks	Class days	Theory
1ST	1ST	**UNIT -I (Overview of Building Services)** Introduction to building services, Classification of buildings as per National Building code.
	2ND	Necessity of building services, Functional requirements of building,
	3RD	Different types of building services i.e. HVAC (Heat, Ventilation and Air Conditioning), Escalators and lifts, fire safety
2ND	1ST	Protection and control, plumbing services,
	2ND	Rain water harvesting, solar water heating system,
	3RD	Lighting, acoustics, sound insulation and electric installation.
3RD	1ST	Role and responsibility of Building Service Engineer
	2ND	Introduction to BMS (Building Management Services)
	3RD	Role of BMS
4TH	1ST	Concept of smart building.
	2ND	**UNIT-II (Modes of vertical communication)** Objectives and modes of vertical communication in building.
	3RD	Lifts: Different types of lifts and its uses
5TH	1ST	Component parts of Lift- Lift Well, Travel, Pit, Hoist Way,
	2ND	Machine, Buffer, Door Locks, Suspended Rope,
	3RD	Lift Car, Landing Door, Call Indicators, Call Push.
6TH	1ST	Design provisions for basic size calculation of space enclosure to accommodate lift services, Safety measures.
	2ND	Escalators: Different Types of Escalators and its Uses.
	3RD	Components of escalators.
7TH	1ST	Design provisions for basic size calculation of space enclosure to accommodate escalator services, Safety measures.
	2ND	Ramp: Necessity, design consideration.
	3RD	Ramp: Gradient calculation, layout.
8TH	1ST	Ramp: Special features required for physically handicapped and elderly.
	2ND	**UNIT-III (Fire Safety)** Fire protection requirements for multistoried building, causes of fire in building.
	3RD	Fire detecting and various extinguishing systems.
9TH	1ST	Working principles of various fire protection systems.
	2ND	Safety against fire in residential and public buildings (multistoried building).
	3RD	National Building Code provision for fire safety.
10TH	1ST	Fire resisting materials and their properties.
	2ND	Fire resistant construction.
	3RD	Procedures for carrying out fire safety inspections of existing buildings.
11TH	1ST	Provisions for evacuation.
	2ND	**UNIT-IV (Plumbing Services)** Importance of plumbing, AHJ (Authority Having Jurisdiction) approval.
	3RD	Plumbing Terminology and Fixtures.
12TH	1ST	Fixtures: Terms used in plumbing, Different types of plumbing fixtures.
	2ND	Fixtures: Shapes/ sizes, capacities, situation and usage, Traps, Interceptors.
	3RD	System of plumbing for building water supply: storage of water.
13TH	1ST	System of plumbing for building water supply: hot and cold water supply system.
	2ND	System of plumbing for building drainage: Types of drainage system such as two pipe system.
	3RD	System of plumbing for building drainage: One pipe system, types of Vents and purpose of venting.
14TH	1ST	System of plumbing for building drainage: Concept of grey water and reclaimed water.
	2ND	Different pipe materials, and jointing methods.
	3RD	Fittings, hanger, supports.
15TH	1ST	Valves used in plumbing and their suitability.
	2ND	Revision
	3RD	Privious year question solve.

R.K.P

Lesson Plan for Transportation Engineering (Code NO. :- CEPC203 TH:2) , Winter-2026-27		
Discipline	**Semester**	**Name of the teaching faculty**
Civil Engineering	3RD	Rajesh Kumar Pradhan, Guest Faculty (Civil Engineering)
Subject: Transportation Engineering (Th-2)		No. of days per Week classes are alloted: 03
No. of weeks-15 weeks		Semester Duration: 20-07-2026 to 05-11-2026
Weeks	**Class days**	**Theory**
1ST	**1ST**	UNIT –I (Overview of Highway Engineering) Role of transportation in the development of nation.
	2ND	Scope and Importance of roads in India and its' Characteristics.
	3RD	Different modes of transportation – land way, waterway, airway. Merits and demerits ofroadway and railway.
2ND	1ST	General classification of roads.
	2ND	Selection and factors affecting road alignment.
	3RD	UNIT –II (Geometric Design of Highway) Camber: Definition, purpose, types as per IRC – recommendations.
3RD	1ST	Kerbs: Road margin, road formation, right of way.
	2ND	Design speed and various factors affecting design speed as per IRC – recommendations.
	3RD	Gradient: Definition, types as per IRC – Recommendations.
4TH	1ST	Sight distance (SSD): Definition, types IRC – recommendations, simple numerical.
	2ND	Curves: Necessity, types: Horizontal, vertical curves.
	3RD	Extra widening of roads: numerical examples.
5TH	1ST	Super elevation: Definition, formula for calculating minimum and maximum Super elevation and method of providing super-elevation.
	2ND	Numerical solution.
	3RD	Standards cross-sections of national highway in embankment and cutting.
6TH	**1ST**	UNIT –III (Construction of Road Pavements) Types of road materials and their Tests – Test on aggregates-Flakiness and Elongation In- dex tests.
	2ND	Angularity Number test, test on Bitumen- penetration, Ductility, Flash and Fire point test and Softening point test.
	3RD	Pavement – Definition, Types, Structural Components of pavement and their functions.
7TH	1ST	Construction of WBM road. Merits and demerits of WBM & WMM road.
	2ND	Construction of Flexible pavement / Bituminous Road, Types of Bitumen.
	3RD	Bitumen - proper- ties, Emulsion, Cutback, Tar.
8TH	1ST	Terms used in BR-prime coat, tack coat, seal coat, Merits andDemerits of BR.
	2ND	Cement concrete road -methods of construction, Alternate and Continuous Bay Method.
	3RD	Construction joints, filler and sealers, merits and demerits of concrete roads.
9TH	1ST	Types of joints.
	2ND	**UNIT –IV (Basics of Railway Engineering)** Classification of Indian Railways, zones of Indian Railways.
	3RD	Permanent way: Ideal requirement.
10TH	1ST	Components; Rail Gauge, types, factors affecting selection of a gauge.
	2ND	Rail, Rail Joints - requirements, types.
	3RD	Creep of rail: causes and prevention.

11TH	1ST	Sleepers - functions and Requirement.
	2ND	Types - concrete sleepers and their density and ballast - function and types, suitability.
	3RD	Rail fixtures and fastenings – fish plate, spikes, bolts, keys, bearing plates.
12TH	1ST	Chairs-types of anchors and anti- creepers.
	2ND	**UNIT - V (Track geometrics, Construction and Maintenance)** Alignment- Factors governing rail alignment.
	3RD	Track Cross sections – standard cross section of single and double line in cutting and embankment. Important terms-permanent land, formation width, side drains.
13TH	1ST	Railway Track Geometrics: Gradient, curves- types and factors affecting, grade compensation.
	2ND	Super elevation, limits of Super elevation on curves, cant deficiency, negative cant, coning of wheel, tilting of rail.
	3RD	Branching of Tracks, Points and crossings, Turn out- types, components, functions and inspection.
14TH	1ST	Track junctions: crossovers, scissor cross over, diamond crossing, track triangle.
	2ND	tation -Purpose, requirement of railway station, important technical terms, types of rail- way station, factors affecting site selection for railway station.
	3RD	Station yard: Classification- Passenger, goods, locomotive and marshalling yards.Function & drawbacks of marshalling yards.
15TH	1ST	Track Maintenance- Necessity, Classification, Tools required for track maintenance with their functions.
	2ND	Organisation of track maintenance, Duties of permanent way inspector, gangmate and key man.
	3RD	Privious Year Question Solve.

R.K.S

Lesson Plan for Engineering Graphics(PR 6), Winter-2026-27		
Discipline	**Years**	**Name of the teaching faculty**
Civil Engineering ,Mechanical Engineering and Electrical Engineering	1ST	Rajesh Kumar Pradhan, Guest Faculty (Civil Engineering)
Subject: Engineering Graphics(PR 6)		No. of days per Week classes are alloted:- 01(2hours/day)
No. of weeks-32 weeks		Semester Duration: 17-08-2026 to 17-04-2027
Weeks	**Class**	**Prcatical**
1ST	1st	**1. Introduction & Demonstration:** Identify various sizes of drawing boards, drawing sheets as pr BIS. List the types of pencils, instruments, and scales (RF).
2ND	1st	Demonstrate lying of drawing sheet, margin, standard layout. Demonstrate lying of title block as per BIS,
3RD	1st	Folding principle of drawings (blue prints, print outs etc). Cheack drawing sheet.
4TH	1st	**2. Types Of Lines, Lettering & Dimensioning:** Demonstrate and explain the use of various types of lines. Demonstrate the principle of single stroke.
5TH	1st	Demonstrate the principle of gothic lettering as per BIS. Demonstrate the principle of numerals as per BIS.
6TH	1st	Introduction to Dimensioning, Unit of Dimensioning.
7TH	1st	General Rules for Dimensioning. **3. Scales:** Significance of scales in drawing; different scales.
8TH	1st	Define and draw plain sale. Define and draw diagonal sale.
9TH	1st	Cheack drawing sheet. **4. Orthographic Projections:** Introduction of projections-orthographic,
10TH	1st	Introduction of projections- perspective. Orthographic Projections: isometric : concept and applications.
11TH	1st	Orthographic Projections: oblique: concept and applications. Introduction to orthographic projection.
12TH	1st	Introduction to First angle. Introduction to Third angle method , their symbols.
13TH	1st	Conversion of pictorial view into Orthographic Views – object containing plain surfaces, Conversion of pictorial view into Orthographic Views- slanting surfaces,
14TH	1st	Conversion of pictorial view into Orthographic Views slots, Conversion of pictorial view into Orthographic Views ribs,
15TH	1st	Conversion of pictorial view into Orthographic Views cylindrical surfaces. Cheack drawing sheet.
16TH	1st	**5.Isometric Projections:** Draw isometric view & Isometric projection of prism, Draw isometric view & Isometric projection of pyramid,
17TH	1st	Draw isometric view & Isometric projection of cone, Draw isometric view & Isometric projection of cylinder with axis horizontal ,
18TH	1st	Draw isometric view & Isometric projection of vertical with construction of isometric scales. Cheack drawing sheet.
19TH	1st	**6. Practices On AutoCAD** Introduction- Components of AutoCAD software window: Title bar
20TH	1st	Introduction- Components of AutoCAD software window: standard tool bar, Introduction- Components of AutoCAD software window: menu bar,
21ST	1st	Introduction- Components of AutoCAD software window: object properties tool bar, Introduction- Components of AutoCAD software window: draw tool bar,
22ND	1st	Introduction- Components of AutoCAD software window: modify tool bar, Introduction- Components of AutoCAD software window: cursor cross hair.

23RD	1st	Command window, status bar, drawing area, UCS icon.
24TH	1st	File features: New file, Saving the file, File features: Creating templates,
25TH	1st	File features: Quit. Setting up new drawing: Units,
26TH	1st	Setting up new drawing: Limits, Setting up new drawing: Grid,
27TH	1st	Setting up new drawing: Snap. Undoing and redoing action.
28TH	1st	**AutoCAD Commands:** Draw various entities by using commands (Line). Draw various entities by using commands (circle).
29TH	1st	Draw various entities by using commands (arc). Draw various entities by using commands (polygon).
30TH	1st	Draw various entities by using commands (ellipse). Draw various entities by using commands (rectangle).
31ST	1st	Edit command, Dimension commands Modify Commands for two dimensional drafting only.
32ND	1st	Cheack drawing sheet. Revision class.

Lesson Plan for Engineering Mechanics(TH 7), Winter 2026-27

Discipline	Years	Name of the teaching faculty
Civil Engineering and Mechanical Engineering	1ST	Rajesh Kumar Pradhan, Guest Faculty (Civil Engineering)
Subject: Engineering Mechanics (TH 7)		No. of days per Week classes are alloted:- 02(2hours/day)
No. of weeks-32 weeks		Semester Duration: 17-08-2026 to 17-04-2027

Weeks	Class days	Theory
1ST	1ST	**Unit:1 (Introduction to Mechanics) 1.1.** Significance and relevance of Mechanics, Applied mechanics, Statics, Dynamics,Space, time, mass, particle, flexible body and rigid body.
	2ND	**1.2.** Scalar and vector quantity, Units of measurement (SI units), Fundamental units and derived units.
2ND	1ST	**1.3.** Force – unit, representation as a vector and by Bow's notation.
	2ND	**1.4.** Characteristics and effects of a force, Principle of transmissibility of force.
3RD	1ST	**Unit:2 (Force system) 2.1.** Force system and its classification.
	2ND	**2.2** Resolution of a force - Orthogonal components of a force
4TH	1ST	**2.3** Moment of a force, Law of moment, State Varignon's Theorem, Couple and it's moment.
	2ND	**2.4** Composition of forces, Resultant force.
5TH	1ST	**2.5** Analytical method for determination of resultant for concurrent, non-concurrent and parallel co planar force system.
	2ND	**2.6** Triangle Law of forces and Polygon Law of forces (Statement Only),
6TH	1ST	Parallelogram law of Forces (Statement and Derivation).
	2ND	**2.7** Simple Numerical on above.
7TH	1ST	Numerical
	2ND	Numerical
8TH	1ST	**Unit:3 (Equilibrium) 3.1** Equilibrium and Equilibrant, Condition of Equilibrium.
	2ND	**3.2** Free body and Free body diagram.
9TH	1ST	**3.3** Analytical and graphical methods of analyzing equilibrium.
	2ND	**3.4** Lami's Theorem – Statement and Explanation.
10TH	1ST	**3.5** Application for various engineering problems.
	2ND	**3.6** Simple Numerical on above.
11TH	1ST	Numerical
	2ND	**3.7** Beam: Types of Loads, Beam, Supports with their Reactions with neat sketch.
12TH	1ST	Numerical
	2ND	**Unit:4 (Friction) 4.1** Friction and its relevance in engineering, types.
13TH	1ST	**4.2** Laws of friction, limiting equilibrium, limiting friction,
	2ND	co-efficient of friction, angle of friction, angle of repose.
14TH	1ST	**4.3** Relation between co-efficient of friction and angle of friction.
	2ND	**4.4** Simple Numerical on above
15TH	1ST	**4.5** Equilibrium of bodies on level surface subjected to force parallel and inclined to plane.
	2ND	**4.6** Equilibrium of bodies on inclined plane subjected to force parallel to the plane only.
16TH	1ST	**4.7** Ladder Friction
	2ND	**4.8** Simple Numerical on above
17TH	1ST	**Unit:5 (Centroid and Centre of Gravity) 5.1** Definition of Centroid, Centroid of geometrical plane figures (square, rectangle)
	2ND	Centroid of geometrical plane figures (triangle, circle, semicircle, quarter circle)
18TH	1ST	**5.2** Centroid of composite figures composed of not more than three geometrical figures.
	2ND	**5.3** Locate centroid of C, I section.
19TH	1ST	Locate centroid of L and T section.
	2ND	**5.4** Definition of Centre of Gravity (C.G.), Centre of Gravity of simple solids (Cube, cuboid, cone).
20TH	1ST	Centre of Gravity of simple solids (cylinder, sphere, hemisphere) (Expression Only) .
	2ND	**Unit:6 (Moment of Inertia) 6.1** Definition of Moment of Inertia (M.I.), M.I. of Plane Figures- (rectangle, square)
21ST	1ST	M.I. of Plane Figures- (triangle, circle, semicircle. (Only Expression).
	2ND	**6.2** Parallel Axis Theorem (Statement and Proof).
22ND	1ST	**6.3** Perpendicular Axis Theorem (Statement and Proof).
	2ND	**6.4** Determination of Moment of Inertia of Composite Section (I and T-Section).
23RD	1ST	**Unit:7 (Simple Lifting Machine) 7.1** Simple lifting machine, load, effort, mechanical advantage, Velocity ratio (V.R.)
	2ND	Efficiency of machines, Applications and advantages.
24TH	1ST	**7.2** Law of machine, Ideal machine, friction in machine.
	2ND	Maximum Mechanical advantage and efficiency.
25TH	1ST	**7.3** Reversible and non-reversible machines, conditions for reversibility.
	2ND	**7.4** Determination of MA, VR and Efficiency of Simple Axle and wheel.
26TH	1ST	Determination of MA, VR and Efficiency of Differential Axle and Wheel.
	2ND	**7.5** Determination of MA, VR and Efficiency of Worm and worm wheel.

27TH	1ST	**7.6** Determination of MA, VR and Efficiency of Single purchase.
	2ND	Determination of MA, VR and Efficiency of double purchase crab winch .
28TH	1ST	**7.7** Determination of MA, VR and Efficiency of Simple Screw Jack .
	2ND	**7.8** Determination of MA, VR and Efficiency of 1st System of Pulleys.
29TH	1ST	Determination of MA, VR and Efficiency of 2nd and 3rd System of Pulleys.
	2ND	**7.9** Simple Numerical on above.
30TH	1ST	**Unit:8 (Gear and Gear Train) 8.1** Gear, Gear Drive, Types of Gear Drive.
	2ND	8.2 Gear Train, Types of Gear Train.
31ST	1ST	8.3 Velocity Ratio of Simple and Compound Gear Train.
	2ND	8.4 Numerical on Simple and Compound Gear Train.
32ND	1ST	Numerical
	2ND	Privious Year Question Solve.

R.K.P