NILASAILA INSTITUTE OF SCIENCE & TECHNOLOGY
SERGARH-756060, BALASORE (ODISHA)
(Approved by AICTE& affiliated to SCTE&VT, Odisha)

LESSON PLAN

SUBJECT: Th-2 (TRANSPORTATION ENGINEERING)

Name Of The Faculty :- Er. Diptimayee Mohanty
Branch :- Civil Engineering **Semester :-** 3rd
Academic Year : 2025-26 **Examination :-** 2025 (w)

CHAPTER WISE DISTRIBUTION OF PERIODS

Sl.No.	Name of the chapter as per the Syllabus	No. of Periods as per the Syllabus	No. of periods actually needed
1	UNIT –I Overview of Highway Engineering	5	8
2	UNIT –II Geometric Design of Highway	10	13
3	UNIT –III Construction of Road Pavements	10	14
4	UNIT –IV Basics of Railway Engineering	10	12
5	UNIT - V Track geometrics, Construction and Maintenance	10	13
	Total Period:	45	60

Mohanty 10.07.'25
Sign of Faculty

10.7.2025
Sign of H.O.D.

Name of the programme: Diploma in Civil ENGINEERING	Semester: 3rd	**Name of the Teaching Faculty:** Er. Diptimayee Mohanty	
		Academic Year : 2025-26 **Examination :** 2025 (W)	
Course Code: CEPC 203 TH-2	**Course Year:** Second Year	**No. of Classes Alloted Per Week :**	4
		Planned Classes Required to Complete the Course	60
Week	**Class Day**	**Topics to be Covered**	
1st	**1st**	**Unit-I: Overview of Highway Engineering** • Role of transportation in the development of nation, Scope and Importance of roads in India and its' Characteristics.	
	2nd	• Different modes of transportation – land way, waterway, airway. Merits and demerits ofroadway and railway;	
	3rd	• Different modes of transportation – land way, waterway, airway. Merits and demerits ofroadway and railway;	
	4th	• 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	• General classification of roads.	
	4th	Revision of Unit-I	
3rd	**1st**	**Unit-II: Geometric Design of Highway** • Camber: Definition, purpose, types as per IRC – recommendations.	
	2nd	• Kerbs: Road margin, road formation, right of way.	
	3rd	• Kerbs: Road margin, road formation, right of way.	
	4th	• Design speed and various factors affecting design speed as per IRC – recommendations.	
4th	**1st**	• Design speed and various factors affecting design speed as per IRC – recommendations.	
	2nd	• Gradient: Definition, types as per IRC – Recommendations.	
	3rd	• Sight distance (SSD): Definition, types IRC – recommendations, simple numerical.	
	4th	• Curves: Necessity, types: Horizontal, vertical curves.	
5th	**1st**	• Extra widening of roads: numerical examples.	
	2nd	• Super elevation: Definition, formula for calculating minimum and maximum Super elevation and method of providing super-elevation.	
	3rd	• Standards cross-sections of national highway in embankment and cutting.	
	4th	• Standards cross-sections of national highway in embankment and cutting.	

Week	Class Day	Topics to be Covered
6th	1st	Revision of Unit-II
	2nd	**Unit-III: Construction of Road Pavements** • Types of road materials and their Tests – Test on aggregates-Flakiness and Elongation In-dex tests, Angularity Number test, test on Bitumen- penetration, Ductility, Flash and Fire point test and Softening point test.
	3rd	• Types of road materials and their Tests – Test on aggregates-Flakiness and Elongation In-dex tests, Angularity Number test, test on Bitumen- penetration, Ductility, Flash and Fire point test and Softening point test.
	4th	• Pavement – Definition, Types, Structural Components of pavement and their functions
7th	1st	• Pavement – Definition, Types, Structural Components of pavement and their functions
	2nd	• Pavement – Definition, Types, Structural Components of pavement and their functions
	3rd	• Construction of WBM road. Merits and demerits of WBM & WMM road.
	4th	• Construction of WBM road. Merits and demerits of WBM & WMM road.
8th	1st	• Construction of WBM road. Merits and demerits of WBM & WMM road.
	2nd	• Construction of WBM road. Merits and demerits of WBM & WMM road.
	3rd	• Construction of Flexible pavement / Bituminous Road, Types of Bitumen and its proper- ties, Emulsion, Cutback, Tar, Terms used in BR-prime coat, tack coat, seal coat, Merits andDemerits of BR.
	4th	• Construction of Flexible pavement / Bituminous Road, Types of Bitumen and its proper- ties, Emulsion, Cutback, Tar, Terms used in BR-prime coat, tack coat, seal coat, Merits andDemerits of BR.
9th	1st	• Construction of Flexible pavement / Bituminous Road, Types of Bitumen and its proper- ties, Emulsion, Cutback, Tar, Terms used in BR-prime coat, tack coat, seal coat, Merits andDemerits of BR.
	2nd	• Construction of Flexible pavement / Bituminous Road, Types of Bitumen and its proper- ties, Emulsion, Cutback, Tar, Terms used in BR-prime coat, tack coat, seal coat, Merits andDemerits of BR.
	3rd	Revision of Unit-III
	4th	**Unit-IV: Basics of Railway Engineering** • Classification of Indian Railways, zones of Indian Railways
10th	1st	• Classification of Indian Railways, zones of Indian Railways
	2nd	• Permanent way: Ideal requirement, Components; Rail Gauge, types, factors affecting selection of a gauge.
	3rd	• Permanent way: Ideal requirement, Components; Rail Gauge, types, factors affecting selection of a gauge.
	4th	• Rail, Rail Joints - requirements, types.
11th	1st	• Rail, Rail Joints - requirements, types.
	2nd	• Creep of rail: causes and prevention.
	3rd	• Sleepers - functions and Requirement, types - concrete sleepers and their density

Week	Class Day	Topics to be Covered
11th	4th	• Sleepers - functions and Requirement, types - concrete sleepers and their density
12th	1st	• Ballast - function and types, suitability.
	2nd	• Rail fixtures and fastenings – fish plate, spikes, bolts, keys, bearing plates, chairs- types of anchors and anti- creepers.
	3rd	Revision of Unit-IV
	4th	**Unit-V: Track geometrics, Construction and Maintenance** • Alignment- Factors governing rail alignment.
13th	1st	• Track Cross sections – standard cross section of single and double line in cutting and em- bankment. Important terms-permanent land, formation width, side drains,
	2nd	• Track Cross sections – standard cross section of single and double line in cutting and em- bankment. Important terms-permanent land, formation width, side drains,
	3rd	• Railway Track Geometrics: Gradient, curves- types and factors affecting, grade compensa- tion, super elevation, limits of Super elevation on curves, cant deficiency, negative cant, con- ing of wheel, tilting of rail.
	4th	• Railway Track Geometrics: Gradient, curves- types and factors affecting, grade compensa- tion, super elevation, limits of Super elevation on curves, cant deficiency, negative cant, con- ing of wheel, tilting of rail.
14th	1st	• Railway Track Geometrics: Gradient, curves- types and factors affecting, grade compensa- tion, super elevation, limits of Super elevation on curves, cant deficiency, negative cant, con- ing of wheel, tilting of rail.
	2nd	• Branching of Tracks, Points and crossings, Turn out- types, components, functions and in- spection. Track junctions: crossovers, scissor cross over, diamond crossing, track triangle.
	3rd	• Branching of Tracks, Points and crossings, Turn out- types, components, functions and in- spection. Track junctions: crossovers, scissor cross over, diamond crossing, track triangle.
	4th	• Station -Purpose, requirement of railway station, important technical terms, types of rail- way station, factors affecting site selection for railway station.
15th	1st	• Station -Purpose, requirement of railway station, important technical terms, types of rail- way station, factors affecting site selection for railway station.
	2nd	• Track Maintenance- Necessity, Classification, Tools required for track maintenance with their functions, Organisation of track maintenance, Duties of permanent way inspector, gangmate and key man.
	3rd	• Track Maintenance- Necessity, Classification, Tools required for track maintenance with their functions, Organisation of track maintenance, Duties of permanent way inspector, gangmate and key man.
	4th	Revision of Unit-V

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