



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

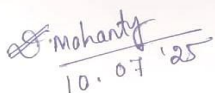
Academic Year : 2025-26

Semester :- 3rd

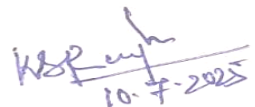
Examination :- 2025 (w)

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


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	
1 st	1 st	Unit-I: Overview of Highway Engineering <ul style="list-style-type: none"> Role of transportation in the development of nation, Scope and Importance of roads in India and its' Characteristics. 	
	2 nd	<ul style="list-style-type: none"> Different modes of transportation – land way, waterway, airway. Merits and demerits of roadway and railway; 	
	3 rd	<ul style="list-style-type: none"> Different modes of transportation – land way, waterway, airway. Merits and demerits of roadway and railway; 	
	4 th	<ul style="list-style-type: none"> Different modes of transportation – land way, waterway, airway. Merits and demerits of roadway and railway; 	
2 nd	1 st	<ul style="list-style-type: none"> General classification of roads. 	
	2 nd	<ul style="list-style-type: none"> Selection and factors affecting road alignment. 	
	3 rd	<ul style="list-style-type: none"> General classification of roads. 	
	4 th	Revision of Unit-I	
3 rd	1 st	Unit-II: Geometric Design of Highway <ul style="list-style-type: none"> Camber: Definition, purpose, types as per IRC – recommendations. 	
	2 nd	<ul style="list-style-type: none"> Kerbs: Road margin, road formation, right of way. 	
	3 rd	<ul style="list-style-type: none"> Kerbs: Road margin, road formation, right of way. 	
	4 th	<ul style="list-style-type: none"> Design speed and various factors affecting design speed as per IRC – recommendations. 	
4 th	1 st	<ul style="list-style-type: none"> Design speed and various factors affecting design speed as per IRC – recommendations. 	
	2 nd	<ul style="list-style-type: none"> Gradient: Definition, types as per IRC – Recommendations. 	
	3 rd	<ul style="list-style-type: none"> Sight distance (SSD): Definition, types IRC – recommendations, simple numerical. 	
	4 th	<ul style="list-style-type: none"> Curves: Necessity, types: Horizontal, vertical curves. 	
5 th	1 st	<ul style="list-style-type: none"> Extra widening of roads: numerical examples. 	
	2 nd	<ul style="list-style-type: none"> Super elevation: Definition, formula for calculating minimum and maximum Super elevation and method of providing super-elevation. 	
	3 rd	<ul style="list-style-type: none"> Standards cross-sections of national highway in embankment and cutting. 	
	4 th	<ul style="list-style-type: none"> Standards cross-sections of national highway in embankment and cutting. 	

Week	Class Day	Topics to be Covered
6 th	1 st	Revision of Unit-II
	2 nd	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.
	3 rd	• 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.
	4 th	• Pavement – Definition, Types, Structural Components of pavement and their functions
7 th	1 st	• Pavement – Definition, Types, Structural Components of pavement and their functions
	2 nd	• Pavement – Definition, Types, Structural Components of pavement and their functions
	3 rd	• Construction of WBM road. Merits and demerits of WBM & WMM road.
	4 th	• Construction of WBM road. Merits and demerits of WBM & WMM road.
8 th	1 st	• Construction of WBM road. Merits and demerits of WBM & WMM road.
	2 nd	• Construction of WBM road. Merits and demerits of WBM & WMM road.
	3 rd	• 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.
	4 th	• 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.
9 th	1 st	• 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.
	2 nd	• 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.
	3 rd	Revision of Unit-III
	4 th	Unit-IV: Basics of Railway Engineering • Classification of Indian Railways, zones of Indian Railways
10 th	1 st	• Classification of Indian Railways, zones of Indian Railways
	2 nd	• Permanent way: Ideal requirement, Components; Rail Gauge, types, factors affecting selection of a gauge.
	3 rd	• Permanent way: Ideal requirement, Components; Rail Gauge, types, factors affecting selection of a gauge.
	4 th	• Rail, Rail Joints - requirements, types.
11 th	1 st	• Rail, Rail Joints - requirements, types.
	2 nd	• Creep of rail: causes and prevention.
	3 rd	• Sleepers - functions and Requirement, types - concrete sleepers and their density

Week	Class Day	Topics to be Covered
11 th	4 th	<ul style="list-style-type: none"> Sleepers - functions and Requirement, types - concrete sleepers and their density
12 th	1 st	<ul style="list-style-type: none"> Ballast - function and types, suitability.
	2 nd	<ul style="list-style-type: none"> Rail fixtures and fastenings – fish plate, spikes, bolts, keys, bearing plates, chairs- types of anchors and anti- creepers.
	3 rd	Revision of Unit-IV
	4 th	Unit-V: Track geometrics, Construction and Maintenance <ul style="list-style-type: none"> Alignment- Factors governing rail alignment.
13 th	1 st	<ul style="list-style-type: none"> Track Cross sections – standard cross section of single and double line in cutting and em- bankment. Important terms-permanent land, formation width, side drains,
	2 nd	<ul style="list-style-type: none"> Track Cross sections – standard cross section of single and double line in cutting and em- bankment. Important terms-permanent land, formation width, side drains,
	3 rd	<ul style="list-style-type: none"> 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.
	4 th	<ul style="list-style-type: none"> 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.
14 th	1 st	<ul style="list-style-type: none"> 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.
	2 nd	<ul style="list-style-type: none"> Branching of Tracks, Points and crossings, Turn out- types, components, functions and in- spection. Track junctions: crossovers, scissor cross over, diamond crossing, track triangle.
	3 rd	<ul style="list-style-type: none"> Branching of Tracks, Points and crossings, Turn out- types, components, functions and in- spection. Track junctions: crossovers, scissor cross over, diamond crossing, track triangle.
	4 th	<ul style="list-style-type: none"> Station -Purpose, requirement of railway station, important technical terms, types of rail- way station, factors affecting site selection for railway station.
15 th	1 st	<ul style="list-style-type: none"> Station -Purpose, requirement of railway station, important technical terms, types of rail- way station, factors affecting site selection for railway station.
	2 nd	<ul style="list-style-type: none"> 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.
	3 rd	<ul style="list-style-type: none"> 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.
	4 th	Revision of Unit-V

Signature of Faculty
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