ACADEMIC LESSON PLAN FOR WINTER SEMESTER-2025

Dept. of Civil Engg, Govt. Polytechnic ,Balasore.

Name of the Faculty :Er. Dibyajyoti Dash LECT. Stage-II(CE)

TH:2- TRANSPORTATION ENGINEERING

Course Code : CEPC 203 /Th2
Theory : 3 P/W
Total Periods: 45 P/ Sem
Examination : 3 Hours
Sem : 3rd Civil Engg.

Teachers Assessment : 10 Marks
Internal Assessment : 20 Marks
End Semester Exam : 70 Marks
TOTAL MARKS : 100 Marks
Start : 14th July 2025

WEEK	PERIOD	TOPIC
1st	1st	**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;
	3rd	Operations on Data Structure Merits and demerits of roadway and railway
2nd	1st	General classification of roads.
	2nd	Selection and factors affecting road alignment.
	3rd	**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
	2nd	maximum Super elevation and method of providing super elevation.
	3rd	Standards cross-sections of national highway in embankment and cutting.
6th	1st	**Construction of Road Pavements**: Types of road materials and their Tests – Test on aggregates-Flakiness and Elongation Index 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
	2nd	Merits and demerits of WBM & WMM road.
	3rd	Construction of Flexible pavement / Bituminous Road,
8th	1st	Types of Bitumen and its proper- ties, Emulsion
	2nd	Cutback, Tar, Terms used in BR-prime coat, tack coat, seal coat, Merits and Demerits of BR.
	3rd	Cement concrete road -methods of construction, Alternate and Continuous Bay Method,
9th	1st	Construction joints, filler and sealers, merits and demerits of concrete roads. Types of joints.

	2nd	**Basics of Railway Engineering** Classification of Indian Railways,
	3rd	zones of Indian Railways
10th	1st	Permanent way: Ideal requirement, Components;
	2nd	Rail Gauge, types, factors affecting selection of a gauge.
	3rd	Rail, Rail Joints - requirements, types. Creep of rail: causes and prevention
11th	1st	Sleepers - functions and Requirement
	2nd	types - concrete sleepers and their density
	3rd	Ballast - function and types, suitability
12th	1st	Rail fixtures and fastenings – fish plate, spikes, bolts, keys, bearing plates, chairs-types of anchors and anti creepers.
	2nd	**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.
13th	1st	Important terms-permanent land, formation width, side drains,
	2nd	Railway Track Geometrics: Gradient, curves- types and factors affecting, grade compensation, super elevation
	3rd	limits of Super elevation on curves, cant deficiency, negative cant, coning of wheel, tilting of rail.
14th	1st	Branching of Tracks, Points and crossings, Turn out- types, components, functions and inspection
	2nd	Track junctions: crossovers, scissor cross over, diamond crossing, track triangle.
	3rd	Station -Purpose, requirement of railway station, important technical terms, types of rail- way station, factors affecting site selection for railway station.
15th	1st	Station yard: Classification- Passenger, goods, locomotive and marshalling yards. Function & drawbacks of marshalling yards.
	2nd	Track Maintenance- Necessity, Classification, Tools required for track maintenance with their functions, Organization of track maintenance, Duties of permanent way inspector, gang mate and key man.
	3rd	Revision

14/07/25