

Discipline: CIVIL	Semester: 3RD	Name of Teaching Faculty:- Shri Manoj Ku Beherdalai, Lect. S-II(Civil)
Subject:- Transportation Engineering	No of Days/Week Class allotted:- 03	Semester from date: 01.07.2026 to 05.11.2026 No of Weeks: 15
Week	Class/ Day	Theory Topics
1st	1st	1. 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 of roadway and railway;
2nd	1st	General classification of roads.
	2nd	Selection and factors affecting road alignment
	3rd	2. 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	Sight distance (SSD): Definition, types IRC – recommendations, simple numerical.
	3rd	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.
6th	1st	3. 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
	3rd	Flash and Fire point test and Softening point test
7th	1st	Pavement – definition, types
	2nd	Structural Components of pavement and their functions
	3rd	Construction of WBM road. Merits and demerits of WBM & WMM road
8th	1st	Construction of Flexible pavement / Bituminous Road, Types of Bitumen and its proper- ties
	2nd	Emulsion, 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,

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9th	1st	Construction joints, filler and sealers, merits and demerits of concrete roads. Types of joints.
	2nd	4. Basics of Railway Engineering: Classification of Indian Railways, zones of Indian Railways.
	3rd	Permanent way: Ideal requirement, Components
10th	1st	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, types - concrete sleepers and their density
	2nd	Ballast - function and types, suitability.
	3rd	Rail fixtures and fastenings – fish plate,
12th	1st	spikes bolts, keys, bearing plates,
	2nd	chairs- types of anchors and anti- creepers.
	3rd	5. 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 embankment. 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. Track junctions: crossovers, scissor cross over, diamond crossing, track triangle.
	2nd	Station -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	Organization of track maintenance
	3rd	Duties of permanent way inspector, gang mate and key man.

B. Manoj
28/6/26