

LESSON PLAN

DISCIPLINE: Civil Engineering	SEMESTER: 5 th Semester (Winter Session-2023-24)	NAME OF THE TEACHING FACULTY: Ganesh Pradhan PTGF (Civil Engg.)
SUBJECT: Railway & Bridge Engineering	NO. OF DAYS/PER WEEK CLASSES ALLOTTED: 4	SEMESTER FROM DATE: TO DATE:
Week	Class Day	NO. OF WEEKS:15 Theory Topic

Section – A: RAILWAYS

1ST	1. Introduction	
	1st	1.1 Railway terminology
		1.2 Advantages of railways
	2nd	1.3 Classification of Indian Railways
	2. Permanent way	
	3rd	2.1 Definition and components of a permanent way
	4th	2.2 Concept of gauge, different gauges prevalent in India, suitability of these gauges under different conditions
2ND	1st	2.2 Concept of gauge, different gauges prevalent in India, suitability of these gauges under different conditions
	2nd	2.2 Concept of gauge, different gauges prevalent in India, suitability of these gauges under different conditions
	3rd	2.2 Concept of gauge, different gauges prevalent in India, suitability of these gauges under different conditions
	3. Track materials	
	4th	3.1 Rails
		3.1.1 Functions and requirement of rails
3RD	1st	3.1.2 Types of rail sections, length of rails
	2nd	3.1.2 Rail joints – types, requirement of an ideal joint
		3.1.4 Purpose of welding of rails & its advantages
	3rd	3.1.5 Creep- definition, cause & prevention
	4th	3.2 Sleepers:
		3.2.1 Definition, function & requirements of sleepers
		3.2.2 Classification of sleepers
4TH	1st	3.2.3 Advantages & disadvantages of different types of sleepers
	2nd	3.3 Ballast:
		3.3.1 Functions & requirements of ballast
	3rd	3.3.2 Materials for ballast
	4th	3.4 Fixtures for Broad gauge

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5 TH	1 st	3.4.1	Connection of rails to rail-fishplate, fish bolts
		3.4.2	Connection of rails to sleepers
		4. Geometric for broad gauge	
	2 nd	4.1	Typical cross – sections of single & double broad gauge railway track in cutting and embankment
	3 rd	4.1	Typical cross – sections of single & double broad gauge railway track in cutting and embankment
6 TH	4 th	4.2	Permanent & temporary land width
	1 st	4.2	Permanent & temporary land width
	2 nd	4.2	Permanent & temporary land width
	3 rd	4.3	Gradients for drainage
7 TH	4 th	4.3	Gradients for drainage
	1 st	4.4	Super elevation – necessity & limiting valued
	2 nd	4.4	Super elevation – necessity & limiting valued
	3 rd	4.4	Super elevation – necessity & limiting valued
		5. Points and crossings	
8 TH	4 th	5.1	Definition, necessity of Points and crossings
	1 st	5.1	Types of points & crossings with tie diagrams
	2 nd	5.1	Types of points & crossings with tie diagrams
	3 rd	5.1	Types of points & crossings with tie diagrams
		6. Laying & maintenance of track	
9 TH	4 th	6.1	Methods of Laying & maintenance of track
	1 st	6.1	Methods of Laying & maintenance of track
	2 nd	6.2	Methods of Laying & maintenance of track
	3 rd	6.2	Duties of a permanent way inspector
		Section – B: BRIDGES	
		1. Introduction to bridges	
10 TH	4 th	1.1	Definitions
		1.2	Components of a bridge
		1.3	Classification of bridges
	1 st	1.4	Requirements of an ideal bridge
		2. Bridge site investigation, hydrology & planning	
11 TH	2 nd	2.1	Selection of bridge site, Alignment,
	3 rd	2.2	Determination of Flood Discharge
	4 th	2.2	Determination of Flood Discharge
	1 st	2.3	Waterway & economic span
	2 nd	2.4	Afflux, clearance & free board
			3. Bridge foundation
	3 rd	3.1	Scour depth minimum depth of foundation
	4 th	3.2	Types of bridge foundations – spread foundation, pile foundation-well foundation – sinking of wells, caission foundation

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12 TH	1 st	3.2	Types of bridge foundations – spread foundation, pile foundation-well foundation – sinking of wells, caission foundation
	2 nd	3.2	Types of bridge foundations – spread foundation, pile foundation-well foundation – sinking of wells, caission foundation
	3 rd	3.2	Types of bridge foundations – spread foundation, pile foundation-well foundation – sinking of wells, caission foundation
	4 th	3.2	Types of bridge foundations – spread foundation, pile foundation-well foundation – sinking of wells, caission foundation
13 TH	1 st	3.3	Coffer dams
	2 nd	3.3	Coffer dams
			4. Bridge substructure and approaches
	3 rd	4.1	Types of piers
	4 th	4.2	Types of abutments
14 TH	1 st	4.2	Types of abutments
	2 nd	4.3	Types of wing walls
	3 rd	4.4	Approaches
			5. Culvert & Cause ways
	4 th	5.1	Types of culvers – brief description
15 TH	1 st	5.1	Types of culvers – brief description
	2 nd	5.1	Types of culvers – brief description
	3 rd	5.2	Types of causeways – brief description
	4 th	5.2	Types of causeways – brief description

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10/08/23

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18/23