

LESSON PLAN: TH-3. RAILWAY & BRIDGE ENGINEERING		
Discipline: Civil Engineering	Semester: 5TH	Name of the Teaching Faculty: ER. BIBHUTI BHUSAN DASH
Subject: RAILWAY & BRIDGE ENGINEERING	No. of days/ per week class allotted: 5	No. of Weeks: 15
Week	Class Day	Theory/ Practical Topics
		Section – A: RAILWAYS
1st	1st	1.0 Introduction : 1.1 Railway terminology
		1.2 Advantages of railways
	2nd	1.3 Classification of Indian Railways
	3rd	2.0 Permanent way 2.1 Definition and components of a permanent way
	4th	2.0 Permanent way 2.1 Definition and components of a permanent way
2nd	1st	2.0 Permanent way 2.1 Definition and components of a permanent way
	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
	4th	2.2 Concept of gauge, different gauges prevalent in India, suitability of these gauges under different conditions
3rd	1st	3.0 Track materials 3.1 Rails 3.1.1 Functions and requirement of rails 3.1.2 Types of rail sections, length of rails
	2nd	3.1.3 Rail joints – types, requirement of an ideal joint 3.1.4 Purpose of welding of rails & its advantages 3.1.5 Creep definition, cause & prevention
	3rd	3.2 Sleepers 3.2.1 Definition, function & requirements of sleepers
	4th	3.2.2 Classification of sleepers 3.2.3 Advantages & disadvantages of different types of sleepers
4th	1st	3.3 Ballast 3.3.1 Functions & requirements of ballast 3.3.2 Materials for ballast
	2nd	3.4 Fixtures for Broad gauge 3.4.1 Connection of rails to rail-fishplate, fish bolts 3.4.2 Connection of rails to sleepers
	3rd	4.0 Geometric for Broad gauge 4.1 Typical cross – sections of single & double broad gauge railway track in cutting and embankment

	4th	4.0 Geometric for Broad gauge 4.1 Typical cross – sections of single & double broad gauge railway track in cutting and embankment
5th	1st	4.0 Geometric for Broad gauge 4.1 Typical cross – sections of single & double broad gauge railway track in cutting and embankment
	2nd	4.2 Permanent & temporary land width
	3rd	4.2 Permanent & temporary land width
	4th	4.3 Gradients for drainage
6th	1st	4.3 Gradients for drainage
	2nd	4.4 Super elevation – necessity & limiting valued
	3rd	4.4 Super elevation – necessity & limiting valued
	4th	4.4 Super elevation – necessity & limiting valued
7th	1st	5.0 Points and crossings 5.1 Definition, necessity of Points and crossings
	2nd	5.0 Points and crossings 5.1 Definition, necessity of Points and crossings
	3rd	5.0 Points and crossings 5.1 Definition, necessity of Points and crossings
	4th	5.2 Types of points & crossings with tie diagrams
8th	1st	5.2 Types of points & crossings with tie diagrams
	2nd	5.2 Types of points & crossings with tie diagrams
	3rd	6.0 Laying & maintenance of track 6.1 Methods of Laying & maintenance of track
	4th	6.0 Laying & maintenance of track 6.1 Methods of Laying & maintenance of track
9th	1st	6.0 Laying & maintenance of track 6.1 Methods of Laying & maintenance of track
	2nd	6.2 Details of a permanent way inspector
	3rd	6.2 Details of a permanent way inspector
	4th	6.2 Details of a permanent way inspector
		Section – B: BRIDGES
10th	1st	7.0 Introductions 7.1 Definitions 7.2 Components of a bridge
	2nd	7.3 Classification of bridges 7.4 Requirements of an ideal bridge
	3rd	8.0 Bridge Site investigation, hydrology & planning 8.1 Selection of bridge site
	4th	8.2 Bridge alignments 8.3 Determination of flood discharge
11th	1st	8.4 Waterway & economic span
	2nd	8.5 Afflux, clearance & free board
	3rd	8.6 Collection of bridge design data & sub surface investigation
	4th	9.0 Bridge foundation 9.1 Scour depth minimum depth of foundation
12th	1st	9.1 Scour depth minimum depth of foundation

	2nd	9.2 Types of bridge, foundations – spread foundation, pile foundation- pile driving, well foundation – sinking of wells, caisson foundation
	3rd	9.2 Types of bridge, foundations – spread foundation, pile foundation- pile driving, well foundation – sinking of wells, caisson foundation
	4th	9.2 Types of bridge, foundations – spread foundation, pile foundation- pile driving, well foundation – sinking of wells, caisson foundation
13th	1st	9.2 Types of bridge, foundations – spread foundation, pile foundation- pile driving, well foundation – sinking of wells, caisson foundation
	2nd	9.3 Cofferdams
	3rd	10.0 Bridge substructure and approaches 10.1 Types of piers
	4th	10.2 Types of abutments
14th	1st	10.2 Types of abutments
	2nd	10.3 Types of wing walls
	3rd	10.4 Approaches
	4th	11.0 Permanent bridges 11.1 Masonry bridges
15th	1st	11.2 Steel bridges – classification with sketches
	2nd	11.3 Concrete bridges – classification, brief description with sketches 11.4 IRC bridge loading
	3rd	12.0 Culvert & cause ways 12.1 Types of culvers - brief description
	4th	12.2 Types of causeways - brief description

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