



## LESSON PLAN

**SUBJECT: Railway & Bridge Engineering (TH-03)**

**Name Of The Faculty :-** Er. Abhilipsa Das

**Branch :-** CIVIL Engineering

**Session :-** 2024-25

**Semester :-** 5Th

**Examination :-** 2024 (w)

1	Introduction	2	2
2	Permanent way	5	7
3	Track materials	10	12
4	Geometric for broad gauge	10	12
5	Points and crossings	4	4
6	Laying & maintenance of track	4	4
Section – B: BRIDGES			
1	Introduction to bridges	2	2
2	Bridge site investigation, hydrology & planning	5	6
3	Bridge foundation	8	10
4	Bridge substructure and approaches	5	6
5	Culvert & Cause Ways	5	6
	Total Period:	60	71

*A. Das*  
28.06.24  
Sign Of Faculty

*K. P. Singh*  
28.06.2024  
Sign of H.O.D.

Discipline: CIVIL ENGINEERING	Semester: 5TH	Name of the Teaching Faculty: Er.Abhilipsa Das	
		SESSION : 2024-25	EXAMINATION : 2024 (W)
Week	Class Day	Topics to be Covered	
1 <sup>st</sup>	1 <sup>st</sup>	PART – A: RAILWAYS UNIT – I 1.1 Introduction to Indian Railways	
	2 <sup>nd</sup>	1.2 Advantages of Railways: Political, Social, Economic and Techno-Economic Advantages.	
	3 <sup>rd</sup>	1.3 Classification of Indian Railways: On the basis of the Importance of Route, Traffic Carried	
	4 <sup>th</sup>	1.3 Classification of Indian Railways: On the basis of the Importance of Route, Traffic Carried	
2 <sup>nd</sup>	1 <sup>st</sup>	1.4 Railway surveys: Traffic surveys, Reconnaissance survey, Preliminary Survey and Detailed Survey.	
	2 <sup>nd</sup>	1.5 Permanent Way: Requirement of an ideal permanent way, Capacity of railway track, Gauges in railway track – Broad, Meter and Narrow Gauges, Selection and Uniformity of gauges, Conning of wheels.	
	3 <sup>rd</sup>	1.6 Subgrade and Embankment for Railway Tracks: Functions of subgrade, Subgrade materials and its improvement - use of geo-synthetics, Slopes of embankment their protection, Stability of embankment .	
	4 <sup>th</sup>	1.6 Subgrade and Embankment for Railway Tracks: Functions of subgrade, Subgrade materials and its improvement - use of geo-synthetics, Slopes of embankment their protection, Stability of embankment.	
3 <sup>rd</sup>	1 <sup>st</sup>	1.7 Track Alignment: Basic requirements of good alignment, Factors influencing the track alignment.	
	2 <sup>nd</sup>	1.8 Geometric Design of the Railway Track: Necessity of geometric design of a railway track, Gradient and Grade compensation, Speed of the train, Degree of curve, Super-elevation and Negative super-elevation.	
	3 <sup>rd</sup>	1.8 Geometric Design of the Railway Track: Necessity of geometric design of a railway track, Gradient and Grade compensation, Speed of the train, Degree of curve, Super-elevation.elevation and Negative super-elevation.	
	4 <sup>th</sup>	1.8 Geometric Design of the Railway Track: Necessity of geometric design of a railway track, Gradient and Grade compensation, Speed of the train, Degree of curve, Super-elevation.elevation and Negative super-elevation.	
4 <sup>th</sup>	1 <sup>st</sup>	UNIT – II 2.1 Construction of Track: Earth work - formation and consolidation, Plate laying – laying of a railway track	
	2 <sup>nd</sup>	2.2 Track Drainage: Sources of moisture in a railway track, Drainage systems – Surface drainage and subsurface drainage.	
4 <sup>th</sup>	3 <sup>rd</sup>	2.2 Track Drainage: Sources of moisture in a railway track, Drainage systems – Surface drainage and subsurface drainage.	
	4 <sup>th</sup>	2.2 Track Drainage: Sources of moisture in a railway track, Drainage systems – Surface drainage and subsurface drainage.	
5 <sup>th</sup>	1 <sup>st</sup>	2.3 Maintenance of Track: Necessity of maintenance, Daily and Periodic maintenance, Maintenance of track alignment.	
	2 <sup>nd</sup>	2.3 Maintenance of Track: Necessity of maintenance, Daily and Periodic maintenance, Maintenance of track alignment.	
	3 <sup>rd</sup>	NUMERICAL SLOVED	



5 <sup>th</sup>	4 <sup>th</sup>	NUMERICAL SLOVED
6 <sup>th</sup>	1 <sup>st</sup>	NUMERICAL SLOVED
	2 <sup>nd</sup>	2.4 Rails: Functions of rails, Requirements of rails, Types of rails – Double Headed Rails.
	3 <sup>rd</sup>	2.4 Rails: Functions of rails, Requirements of rails, Types of rails – Double Headed Rails.
	4 <sup>th</sup>	2.4 Rails: Functions of rails, Requirements of rails, Types of rails – Double Headed Rails.
7 <sup>th</sup>	1 <sup>st</sup>	2.4 Rails: Functions of rails, Requirements of rails, Types of rails – Double Headed Rails.
	2 <sup>nd</sup>	2.5 Ballast: Functions of ballast, Requirement of the good ballast, Types of ballast,
	3 <sup>rd</sup>	2.5 Ballast: Functions of ballast, Requirement of the good ballast, Types of ballast,
	4 <sup>th</sup>	2.5 Ballast: Functions of ballast, Requirement of the good ballast, Types of ballast,
8 <sup>th</sup>	1 <sup>st</sup>	2.5 Ballast: Functions of ballast, Requirement of the good ballast, Types of ballast,
	2 <sup>nd</sup>	2.6 Sleepers: Functions of sleepers, Requirements of sleepers, Reinforced and Prestressed Concrete.
	3 <sup>rd</sup>	2.6 Sleepers: Functions of sleepers, Requirements of sleepers, Reinforced and Prestressed Concrete.
	4 <sup>th</sup>	2.6 Sleepers: Functions of sleepers, Requirements of sleepers, Reinforced and Prestressed Concrete.
9 <sup>th</sup>	1 <sup>st</sup>	2.7 Stations and Platforms: Site selection for railway station, Requirement of a railway station
	2 <sup>nd</sup>	2.7 Stations and Platforms: Site selection for railway station, Requirement of a railway station
	3 <sup>rd</sup>	2.7 Stations and Platforms: Site selection for railway station, Requirement of a railway station
	4 <sup>th</sup>	2.7 Stations and Platforms: Site selection for railway station, Requirement of a railway station
10 <sup>th</sup>	1 <sup>st</sup>	2.7 Stations and Platforms: Site selection for railway station, Requirement of a railway station
	3 <sup>rd</sup>	2.7 Stations and Platforms: Site selection for railway station, Requirement of a railway station
	4 <sup>th</sup>	PART – B: BRIDGES UNIT-II 3.1 Bridges: Definition and Basic forms, Components of a bridge, Difference between a bridge and a culvert, Classifications of bridges (only names), Importance of bridges, Standard specifications.
11 <sup>th</sup>	1 <sup>st</sup>	PART – B: BRIDGES UNIT-II 3.1 Bridges: Definition and Basic forms, Components of a bridge, Difference between a bridge and a culvert, Classifications of bridges (only names), Importance of bridges, Standard specifications.

11 <sup>th</sup>	2 <sup>nd</sup>	PART – B: BRIDGES UNIT-II 3.1 Bridges: Definition and Basic forms, Components of a bridge, Difference between a bridge and a culvert, Classifications of bridges (only names), Importance of bridges, Standard specifications.
	3 <sup>rd</sup>	INTERNAL ASSESMENT
	4 <sup>th</sup>	INTERNAL ASSESMENT
12 <sup>th</sup>	1 <sup>st</sup>	3.2 Investigation for Bridges: Need of investigation, Selection of bridge site, Linear waterway,
	2 <sup>nd</sup>	3.2 Investigation for Bridges: Need of investigation, Selection of bridge site, Linear waterway,
	3 <sup>rd</sup>	3.2 Investigation for Bridges: Need of investigation, Selection of bridge site, Linear waterway,
	4 <sup>th</sup>	3.2 Investigation for Bridges: Need of investigation, Selection of bridge site, Linear waterway,
13 <sup>th</sup>	1 <sup>st</sup>	3.3 Bridge Substructure: Pier and Abutment Caps, Materials for Piers and Abutments, Pier – Loads and Forces to be considered in the design of piers.
	2 <sup>nd</sup>	3..3 Bridge Substructure: Pier and Abutment Caps, Materials for Piers and Abutments, Pier – Loads and Forces to be considered in the design of piers.
	3 <sup>rd</sup>	3.4 Abutments - Loads and Forces to be considered in the design of abutments, Back-fill behind the abutments, Wing walls – Straight, Splayed, Return and Curved wing walls.
	4 <sup>th</sup>	3.4 Abutments - Loads and Forces to be considered in the design of abutments, Back-fill behind the abutments, Wing walls – Straight, Splayed, Return and Curved wing walls.
14 <sup>th</sup>	1 <sup>st</sup>	4.1. Introduction only for the: Balanced Cantilever Bridges, Continuous Girder Bridges, Rigid Frame
	2 <sup>nd</sup>	4.1. Introduction only for the: Balanced Cantilever Bridges, Continuous Girder Bridges, Rigid Frame
	3 <sup>rd</sup>	4.2 Prestressed Concrete Bridges: Types of prestressed concrete bridges, Erection of precast girders, Segmental cantilever construction, Cast-in-place segments, Precast
	4 <sup>th</sup>	4.2 Prestressed Concrete Bridges: Types of prestressed concrete bridges, Erection of precast girders, Segmental cantilever construction, Cast-in-place segments, Precast segments, Connection at mid-span,
15 <sup>th</sup>	1 <sup>st</sup>	4.3 Construction of Bridges: Incremental Push Launching Method
	2 <sup>nd</sup>	4.3 Construction of Bridges: Incremental Push Launching Method
	3 <sup>rd</sup>	4.3 Construction of Bridges: Incremental Push Launching Method
	4 <sup>th</sup>	4.3 Construction of Bridges: Incremental Push Launching Method
16 <sup>th</sup>	1 <sup>st</sup>	4.4 Bridge Bearings: Purpose of bearings, Types of Bearing – Sliding Plate Bearing, Sliding cum-Rocker Bearing, Steel Roller-cum-Rocker Bearing, Elastomeric Bearing
	2 <sup>nd</sup>	4.4 Bridge Bearings: Purpose of bearings, Types of Bearing – Sliding Plate Bearing, Sliding cum-Rocker Bearing, Steel Roller-cum-Rocker Bearing, Elastomeric Bearing



16 <sup>th</sup>	3 <sup>rd</sup>	4.4 Bridge Bearings: Purpose of bearings, Types of Bearing – Sliding Plate Bearing, Sliding cum-Rocker Bearing, Steel Roller-cum-Rocker Bearing, Elastomeric Bearing
	4 <sup>th</sup>	4.5 Maintenance of Bridges: Inspection of bridges, Maintenance – Routine, Preventive, Repairs and Strengthening / Replacement Maintenances, Maintenance of Bearings.
17 <sup>th</sup>	1 <sup>st</sup>	4.5 Maintenance of Bridges: Inspection of bridges, Maintenance – Routine, Preventive, Repairs and Strengthening / Replacement Maintenances, Maintenance of Bearings.
	2 <sup>nd</sup>	4.5 Maintenance of Bridges: Inspection of bridges, Maintenance – Routine, Preventive, Repairs and Strengthening / Replacement Maintenances, Maintenance of Bearings.
	3 <sup>rd</sup>	4.5 Maintenance of Bridges: Inspection of bridges, Maintenance – Routine, Preventive, Repairs and Strengthening / Replacement Maintenances, Maintenance of Bearings.
	4 <sup>th</sup>	4.5 Maintenance of Bridges: Inspection of bridges, Maintenance – Routine, Preventive, Repairs and Strengthening / Replacement Maintenances, Maintenance of Bearings.
18 <sup>th</sup>	1 <sup>st</sup>	4.5 Maintenance of Bridges: Inspection of bridges, Maintenance – Routine, Preventive, Repairs and Strengthening / Replacement Maintenances, Maintenance of Bearings.
	2 <sup>nd</sup>	4.5 Maintenance of Bridges: Inspection of bridges, Maintenance – Routine, Preventive, Repairs and Strengthening / Replacement Maintenances, Maintenance of Bearings.
	3 <sup>rd</sup>	4.5 Maintenance of Bridges: Inspection of bridges, Maintenance – Routine, Preventive, Repairs and Strengthening / Replacement Maintenances, Maintenance of Bearings.
	4 <sup>th</sup>	Revision .

*A. Das*  
28.06.2024  
Sign of Faculty

*KSP*  
28/06/2024  
Sign of H.O.D.