NILASAILA INSTITUTE OF SCIENCE & TECHNOLOGY
SERGARH-756060, BALASORE (ODISHA)
(Approved by AICTE& affiliated to SCTE&VT, Odisha)

LESSON PLAN

SUBJECT: Railway & Bridge Engineering (TH-03)

Name Of The Faculty :- Er. ABHILIPSA DAS
Branch :- Civil Engineering **Semester :-** 5th
Academic Year : 2025-26 **Examination :-** 2025 (w)

CHAPTER WISE DISTRIBUTION OF PERIODS

Sl.No.	Name of the chapter as per the Syllabus	No. of Periods as per the Syllabus	No. of periods actually needed
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	75

A. Das
10.07.25
Sign of Faculty

10.7.2025
Sign of H.O.D.

Name of the programme: Diplomain Civil ENGINEERING	Semester: 5th	**Name of the Teaching Faculty:** Er.ABHILIPSA DAS	
		Academic Year : 2025-26 **Examination :** 2025 (W)	
Course Code: TH-03	**Course Year:** Third Year	**No. of Classes Alloted Per Week :**	5
		Planned Classes Required to Complete the Course	75

Week	Class Day	Topics to be Covered
1st	1st	PART – A: RAILWAYS UNIT – I 1.1 Introduction to Indian Railways
	2nd	1.2 Advantages of Railways: Political, Social, Economic and Techno-Economic Advantages.
	3rd	1.3 Classification of Indian Railways: On the basis of the Importance of Route, Traffic Carried
	4th	1.3 Classification of Indian Railways: On the basis of the Importance of Route, Traffic Carried
	5th	1.3 Classification of Indian Railways: On the basis of the Importance of Route, Traffic Carried
2nd	1st	1.4 Railway surveys: Traffic surveys, Reconnaissance survey, Preliminary Survey and Detailed Survey.
	2nd	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.
	3rd	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 .
	4th	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.
	5th	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.
3rd	1st	1.7 Track Alignment: Basic requirements of good alignment, Factors influencing the track alignment.
	2nd	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.
	3rd	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.
	4th	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.
	5th	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.

4th	1st	UNIT – II 2.1 Construction of Track: Earth work - formation and consolidation, Plate laying – laying of a railway track
	2nd	2.2 Track Drainage: Sources of moisture in a railway track, Drainage systems – Surface drainage and subsurface drainage.
	3rd	2.2 Track Drainage: Sources of moisture in a railway track, Drainage systems – Surface drainage and subsurface drainage.
	4th	2.2 Track Drainage: Sources of moisture in a railway track, Drainage systems – Surface drainage and subsurface drainage.
	5th	2.2 Track Drainage: Sources of moisture in a railway track, Drainage systems – Surface drainage and subsurface drainage.
5th	1st	2.3 Maintenance of Track: Necessity of maintenance, Daily and Periodic maintenance, Maintenance of track alignment.
	2nd	2.3 Maintenance of Track: Necessity of maintenance, Daily and Periodic maintenance, Maintenance of track alignment.
	3rd	NUMERICAL SLOVING CLASS
	4th	NUMERICAL SLOVING CLASS
	5th	NUMERICAL SLOVING CLASS
6th	1st	NUMERICAL SLOVING CLASS
	2nd	2.4 Rails: Functions of rails, Requirements of rails, Types of rails – Double Headed Rails.
	3rd	2.4 Rails: Functions of rails, Requirements of rails, Types of rails – Double Headed Rails.
	4th	2.4 Rails: Functions of rails, Requirements of rails, Types of rails – Double Headed Rails.
	5th	2.4 Rails: Functions of rails, Requirements of rails, Types of rails – Double Headed Rails.
7th	1st	2.4 Rails: Functions of rails, Requirements of rails, Types of rails – Double Headed Rails.
	2nd	2.5 Ballast: Functions of ballast, Requirement of the good ballast, Types of ballast,
	3rd	2.5 Ballast: Functions of ballast, Requirement of the good ballast, Types of ballast,
	4th	2.5 Ballast: Functions of ballast, Requirement of the good ballast, Types of ballast,
	5th	2.5 Ballast: Functions of ballast, Requirement of the good ballast, Types of ballast,
8th	1st	2.5 Ballast: Functions of ballast, Requirement of the good ballast, Types of ballast,
	2nd	2.6 Sleepers: Functions of sleepers, Requirements of sleepers, Reinforced and Prestressed Concrete.
	3rd	2.6 Sleepers: Functions of sleepers, Requirements of sleepers, Reinforced and Prestressed Concrete.
	4th	2.6 Sleepers: Functions of sleepers, Requirements of sleepers, Reinforced and Prestressed Concrete.
	5th	2.6 Sleepers: Functions of sleepers, Requirements of sleepers, Reinforced and Prestressed Concrete.
9th	1st	2.7 Stations and Platforms: Site selection for railway station, Requirement of a railway station
	2nd	2.7 Stations and Platforms: Site selection for railway station, Requirement of a railway station

9th	3rd	2.7 Stations and Platforms: Site selection for railway station, Requirement of a railway station
	4th	2.7 Stations and Platforms: Site selection for railway station, Requirement of a railway station
	5th	2.7 Stations and Platforms: Site selection for railway station, Requirement of a railway station
10th	1st	2.7 Stations and Platforms: Site selection for railway station, Requirement of a railway station
	2nd	2.7 Stations and Platforms: Site selection for railway station, Requirement of a railway station
	3rd	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.
	4th	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.
	5th	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.
11th	1st	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.
	2nd	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.
	3rd	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.
	4th	3.2 Investigation for Bridges: Need of investigation, Selection of bridge site, Linear waterway,
	5th	3.2 Investigation for Bridges: Need of investigation, Selection of bridge site, Linear waterway,
12th	1st	3.2 Investigation for Bridges: Need of investigation, Selection of bridge site, Linear waterway,
	2nd	3.2 Investigation for Bridges: Need of investigation, Selection of bridge site, Linear waterway,
	3rd	3.2 Investigation for Bridges: Need of investigation, Selection of bridge site, Linear waterway,
	4th	3.2 Investigation for Bridges: Need of investigation, Selection of bridge site, Linear waterway,
	5th	3.2 Investigation for Bridges: Need of investigation, Selection of bridge site, Linear waterway,
13th	1st	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.
	2nd	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.

13th	3rd	3.4Abutments - Loads and Forces to be considered in the design of abutments, Back-fill behind the abutments,Wing walls – Straight, Splayed, Return and Curved wing
	4th	3.4Abutments - Loads and Forces to be considered in the design of abutments, Back-fill behind the abutments,Wing walls – Straight, Splayed, Return and Curved wing
	5th	3.4Abutments - Loads and Forces to be considered in the design of abutments, Back-fill behind the abutments,Wing walls – Straight, Splayed, Return and Curved wing
14th	1st	4.1. Introduction only for the: Balanced Cantilever Bridges, Continuous Girder Bridges, Rigid Frame
	2nd	4.1. Introduction only for the: Balanced Cantilever Bridges, Continuous Girder Bridges, Rigid Frame
	3rd	4.2 Prestressed Concrete Bridges: Types of prestressed concrete bridges, Erection of precast girders, Segmental cantilever construction, Cast-in-place segments, Precast
	4th	4.2 Prestressed Concrete Bridges: Types of prestressed concrete bridges, Erection of precast girders, Segmental cantilever construction, Cast-in-place segments, Precast
	5th	4.2 Prestressed Concrete Bridges: Types of prestressed concrete bridges, Erection of precast girders, Segmental cantilever construction, Cast-in-place segments, Precast
15th	1st	4.3 Construction of Bridges: Incremental Push Launching Method
	2nd	4.3 Construction of Bridges: Incremental Push Launching Method
	3rd	4.3 Construction of Bridges: Incremental Push Launching Method
	4th	4.3 Construction of Bridges: Incremental Push Launching Method
	5th	4.3 Construction of Bridges: Incremental Push Launching Method

A. Das
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