



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



LESSON PLAN

SUBJECT: Th-3 (Railway & Bridge Engineering)

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	5
3	Track materials	10	10
4	Geometric for broad gauge	10	10
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	8
4	Bridge substructure and approaches	5	6
5	Culvert & Cause Ways	5	5
	Total Period:	60	62

Discipline: CIVIL ENGINEERING	Semester: 5TH	Name of the Teaching Faculty: Er. ABHILIPSA DAS
		SESSION : 2023-24 EXAMINATION : 2023 (W)
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
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.
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.
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.

5 th	1 st	2.3 Maintenance of Track: Necessity of maintenance, Daily and Periodic maintenance, Maintenance of track alignment.
	2 nd	2.3 Maintenance of Track: Necessity of maintenance, Daily and Periodic maintenance, Maintenance of track alignment.
	3 rd	NUMERICAL SLOVED
	4 th	NUMERICAL SLOVED
6 th	1 st	NUMERICAL SLOVED
Week	Class Day	Topics to be Covered
6 th	2 nd	2.4 Rails: Functions of rails, Requirements of rails, Types of rails – Double Headed Rails.
	3 rd	2.4 Rails: Functions of rails, Requirements of rails, Types of rails – Double Headed Rails.
	4 th	2.4 Rails: Functions of rails, Requirements of rails, Types of rails – Double Headed Rails.
7 th	1 st	2.4 Rails: Functions of rails, Requirements of rails, Types of rails – Double Headed Rails.
	2 nd	2.5 Ballast: Functions of ballast, Requirement of the good ballast, Types of ballast,
	3 rd	2.5 Ballast: Functions of ballast, Requirement of the good ballast, Types of ballast,
	4 th	2.5 Ballast: Functions of ballast, Requirement of the good ballast, Types of ballast,
8 th	1 st	2.5 Ballast: Functions of ballast, Requirement of the good ballast, Types of ballast,
	2 nd	2.6 Sleepers: Functions of sleepers, Requirements of sleepers, Reinforced and Prestressed Concrete.
	3 rd	2.6 Sleepers: Functions of sleepers, Requirements of sleepers, Reinforced and Prestressed Concrete.
	4 th	2.6 Sleepers: Functions of sleepers, Requirements of sleepers, Reinforced and Prestressed Concrete.
9 th	1 st	2.7 Stations and Platforms: Site selection for railway station, Requirement of a railway station
	2 nd	2.7 Stations and Platforms: Site selection for railway station, Requirement of a railway station
	3 rd	2.7 Stations and Platforms: Site selection for railway station, Requirement of a railway station
	4 th	2.7 Stations and Platforms: Site selection for railway station, Requirement of a railway station
	1 st	2.7 Stations and Platforms: Site selection for railway station, Requirement of a railway station
	2 nd	2.7 Stations and Platforms: Site selection for railway station, Requirement of a railway station

10 th	3 rd	2.7 Stations and Platforms: Site selection for railway station, Requirement of a railway station
	4 th	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 th	1 st	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.
	2 nd	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.
Week	Class Day	Topics to be Covered
11 th	3 rd	INTERNAL ASSESMENT
	4 th	INTERNAL ASSESMENT
12 th	1 st	3.2 Investigation for Bridges: Need of investigation, Selection of bridge site, Linear waterway,
	2 nd	3.2 Investigation for Bridges: Need of investigation, Selection of bridge site, Linear waterway,
	3 rd	3.2 Investigation for Bridges: Need of investigation, Selection of bridge site, Linear waterway,
	4 th	3.2 Investigation for Bridges: Need of investigation, Selection of bridge site, Linear waterway,
13 th	1 st	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 nd	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 rd	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 walls.
	4 th	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 walls.
	1 st	4.1. Introduction only for the: Balanced Cantilever Bridges, Continuous Girder Bridges, Rigid Frame
	2 nd	4.1. Introduction only for the: Balanced Cantilever Bridges, Continuous Girder Bridges, Rigid Frame

14 th	3 rd	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,
	4 th	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 th	1 st	4.3 Construction of Bridges: Incremental Push Launching Method
	2 nd	4.3 Construction of Bridges: Incremental Push Launching Method
	3 rd	4.3 Construction of Bridges: Incremental Push Launching Method
	4 th	4.3 Construction of Bridges: Incremental Push Launching Method
16 th	1 st	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 nd	4.4 Bridge Bearings: Purpose of bearings, Types of Bearing – Sliding Plate Bearing, Sliding cum-Rocker Bearing, Steel Roller-cum-Rocker Bearing, Elastomeric Bearing
	3 rd	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 th	4.5 Maintenance of Bridges: Inspection of bridges, Maintenance – Routine, Preventive, Repairs and Strengthening / Replacement Maintenances, Maintenance of Bearings.
17 th	1 st	4.5 Maintenance of Bridges: Inspection of bridges, Maintenance – Routine, Preventive, Repairs and Strengthening / Replacement Maintenances, Maintenance of Bearings.
Week	Class Day	Topics to be Covered
17 th	2 nd	4.5 Maintenance of Bridges: Inspection of bridges, Maintenance – Routine, Preventive, Repairs and Strengthening / Replacement Maintenances, Maintenance of Bearings.
	3 rd	REVISION
	4 th	REVISION