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

LESSON PLAN

SUBJECT : Th-4 (HIGHWAY ENGINEERING)

Name Of The Faculty :- Er. Diptimayee Mohanty
Branch :- Civil Engineering **Semester :-** 4th
Session :- 2024-25 **Examination :-** 2025 (S)

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	5	5
2	Road Geometrics	20	20
3	Road Materials	9	9
4	Road Pavements	13	13
5	Hill Roads	7	7
6	Road Drainage	7	7
7	Road Maintenance :	7	7
8	Construction equipments	7	7
	Total Period:	75	75

D. Mohanty 21.02.'25
Sign of Faculty

Sign of H.O.B. 21.02.25

Discipline: CIVIL ENGINEERING	Semester: 4th	Name of the Teaching Faculty: Er. Diptimayee Mohanty
		SESSION : 2024-25 EXAMINATION : 2025 (S)
Week	**Class Day**	**Topics to be Covered**
1st	1st	**Introduction:** 1.1 Importance of Highway transportation: importance organizations like Indian roads congress, Ministry of Surface Transport, Central Road Research Institute
	2nd	1.2 Functions of Indian Roads Congress
	3rd	1.3 IRC classification of roads
	4th	1.3 IRC classification of roads
	5th	1.4 Organisation of state highway department
2nd	1st	**Road Geometrics:** 2.1 Glossary of terms used in geometric and their importance, right of way, formation width, road margin, road shoulder, carriage way, side slopes, kerbs, formation level, camber and gradient
	2nd	2.1 Glossary of terms used in geometric and their importance, right of way, formation width, road margin, road shoulder, carriage way, side slopes, kerbs, formation level, camber and gradient
	3rd	2.1 Glossary of terms used in geometric and their importance, right of way, formation width, road margin, road shoulder, carriage way, side slopes, kerbs, formation level, camber and gradient
	4th	2.1 Glossary of terms used in geometric and their importance, right of way, formation width, road margin, road shoulder, carriage way, side slopes, kerbs, formation level, camber and gradient
	5th	2.1 Glossary of terms used in geometric and their importance, right of way, formation width, road margin, road shoulder, carriage way, side slopes, kerbs, formation level, camber and gradient
3rd	1st	2.1 Glossary of terms used in geometric and their importance, right of way, formation width, road margin, road shoulder, carriage way, side slopes, kerbs, formation level, camber and gradient
	2nd	2.1 Glossary of terms used in geometric and their importance, right of way, formation width, road margin, road shoulder, carriage way, side slopes, kerbs, formation level, camber and gradient
	3rd	2.2 Design and average running speed, stopping and passing sight distance

3rd	4th	2.2 Design and average running speed, stopping and passing sight distance
	5th	2.2 Design and average running speed, stopping and passing sight distance
4th	1st	2.2 Design and average running speed, stopping and passing sight distance
	2nd	2.2 Design and average running speed, stopping and passing sight distance
	3rd	2.2 Design and average running speed, stopping and passing sight distance
	4th	2.3 Necessity of curves, horizontal and vertical curves including transition curves and super elevation, Methods of providing super – elevation
	5th	2.3 Necessity of curves, horizontal and vertical curves including transition curves and super elevation, Methods of providing super – elevation
5th	1st	2.3 Necessity of curves, horizontal and vertical curves including transition curves and super elevation, Methods of providing super – elevation
	2nd	2.3 Necessity of curves, horizontal and vertical curves including transition curves and super elevation, Methods of providing super – elevation
	3rd	2.3 Necessity of curves, horizontal and vertical curves including transition curves and super elevation, Methods of providing super – elevation
	4th	2.3 Necessity of curves, horizontal and vertical curves including transition curves and super elevation, Methods of providing super – elevation
	5th	2.3 Necessity of curves, horizontal and vertical curves including transition curves and super elevation, Methods of providing super – elevation
6th	1st	**Road Materials:** 3.1 Difference types of road materials in use: soil, aggregates, and binders
	2nd	3.1 Difference types of road materials in use: soil, aggregates, and binders
	3rd	3.2 Function of soil as highway Subgrade
	4th	3.2 Function of soil as highway Subgrade
	5th	3.3 California Bearing Ratio: methods of finding CBR valued in the laboratory and at site and their significance
7th	1st	3.3 California Bearing Ratio: methods of finding CBR valued in the laboratory and at site and their significance
	2nd	3.3 California Bearing Ratio: methods of finding CBR valued in the laboratory and at site and their significance
	3rd	3.4 Testing aggregates: Abrasion test, impact test, crushing strength test, water absorption test & soundness test

7th	4th	3.4 Testing aggregates: Abrasion test, impact test, crushing strength test, water absorption test & soundness test
	5th	**Road Pavements:** 4.1 Road Pavement: Flexible and rigid pavement, their merits and demerits, typical cross-sections, functions of various components
8th	1st	4.1 Road Pavement: Flexible and rigid pavement, their merits and demerits, typical cross-sections, functions of various components
	2nd	Flexible pavements: 4.2 Sub-grade preparation: Setting out alignment of road, setting out bench marks, control pegs for embankment and cutting, borrow pits, making profile of embankment, construction of embankment, compaction, stabilization, preparation of subgrade, methods of checking camber, gradient and alignment as per recommendations of IRC, equipment used for subgrade preparation
	3rd	Flexible pavements: 4.2 Sub-grade preparation: Setting out alignment of road, setting out bench marks, control pegs for embankment and cutting, borrow pits, making profile of embankment, construction of embankment, compaction, stabilization, preparation of subgrade, methods of checking camber, gradient and alignment as per recommendations of IRC, equipment used for subgrade preparation
	4th	Flexible pavements: 4.2 Sub-grade preparation: Setting out alignment of road, setting out bench marks, control pegs for embankment and cutting, borrow pits, making profile of embankment, construction of embankment, compaction, stabilization, preparation of subgrade, methods of checking camber, gradient and alignment as per recommendations of IRC, equipment used for subgrade preparation
	5th	4.3 Sub base Course: Necessity of sub base, stabilized sub base, purpose of stabilization (no designs) Types of stabilization • Mechanical stabilization • Lime stabilization • Cement stabilization • Fly ash stabilization

9th	1st	4.3 Sub base Course: Necessity of sub base, stabilized sub base, purpose of stabilization (no designs) Types of stabilization • Mechanical stabilization • Lime stabilization • Cement stabilization • Fly ash stabilization
	2nd	4.4 Base Course: Preparation of base course, Brick soling, stone soling and metalling, Water Bound Macadam and wet-mix Macadam, Bituminous constructions: Different types
	3rd	4.4 Base Course: Preparation of base course, Brick soling, stone soling and metalling, Water Bound Macadam and wet-mix Macadam, Bituminous constructions: Different types
	4th	4.5 Surfacing: • Surface dressing (i) Premix carpet and (ii) Semi dense carpet • Bituminous concrete • Grouting
	5th	4.5 Surfacing: • Surface dressing (i) Premix carpet and (ii) Semi dense carpet • Bituminous concrete • Grouting
10th	1st	4.6 Rigid Pavements Concept of concrete roads as per IRC specifications
	2nd	4.6 Rigid Pavements Concept of concrete roads as per IRC specifications
	3rd	**Hill Roads:** 5.1 Introduction: Typical cross-sections showing all details of a typical hill road in cut, partly in cutting and partly in filling
	4th	5.1 Introduction: Typical cross-sections showing all details of a typical hill road in cut, partly in cutting and partly in filling
	5th	5.2 Breast Walls, Retaining walls, different types of bends
11th	1st	**INTERNAL ASSESSMENT**
	2nd	**INTERNAL ASSESSMENT**

11th	3rd	5.2 Breast Walls, Retaining walls, different types of bends
	4th	5.2 Breast Walls, Retaining walls, different types of bends
	5th	**Road Drainage:** 6.1 Necessity of road drainage work, cross drainage works
12th	1st	6.1 Necessity of road drainage work, cross drainage works
	2nd	6.1 Necessity of road drainage work, cross drainage works
	3rd	6.2 Surface and sub-surface drains and storm water drains. Location, spacing and typical details of side drains, side ditches for surface drainage, intercepting drains, pipe drains in hill roads, details of drains in cutting embankment, typical cross sections
	4th	6.2 Surface and sub-surface drains and storm water drains. Location, spacing and typical details of side drains, side ditches for surface drainage, intercepting drains, pipe drains in hill roads, details of drains in cutting embankment, typical cross sections
	5th	6.2 Surface and sub-surface drains and storm water drains. Location, spacing and typical details of side drains, side ditches for surface drainage, intercepting drains, pipe drains in hill roads, details of drains in cutting embankment, typical cross sections
13th	1st	6.2 Surface and sub-surface drains and storm water drains. Location, spacing and typical details of side drains, side ditches for surface drainage, intercepting drains, pipe drains in hill roads, details of drains in cutting embankment, typical cross sections
	2nd	**Road Maintenance** 7.1 Common types of road failures – their causes and remedies
	3rd	7.1 Common types of road failures – their causes and remedies
	4th	7.2 Maintenance of bituminous road such as patch work and resurfacing
	5th	7.3 Maintenance of concrete roads – filling cracks, repairing joints, maintenance of shoulders (berm), maintenance of traffic control devices
14th	1st	7.3 Maintenance of concrete roads – filling cracks, repairing joints, maintenance of shoulders (berm), maintenance of traffic control devices
	2nd	7.4 Basic concept of traffic study, Traffic safety and traffic control signal
	3rd	7.4 Basic concept of traffic study, Traffic safety and traffic control signal
	4th	**Construction equipments:** Preliminary ideas of the following plant and equipment: 8.1 Hot mixing plant

14th	5th	8.2 Tipper, tractors (wheel and crawler) scraper, bulldozer, dumpers, shovels, graders, roller dragline
15th	1st	8.2 Tipper, tractors (wheel and crawler) scraper, bulldozer, dumpers, shovels, graders, roller dragline
	2nd	8.3 Asphalt mixer and tar boilers
	3rd	8.4 Road pavers
	4th	8.5 Modern construction equipments for roads
	5th	8.5 Modern construction equipments for roads

S. Mohanty 01.02.25

Sign of Faculty

01.02.25

Sign of H.O.D.