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

LESSON PLAN

SUBJECT: Th-4 (HIGHWAY ENGINEERING)

CHAPTER WISE DISTRIBUTION OF PERIODS

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

Discipline: CIVIL ENGG.	**Semester:** 4TH	**Name of the Teaching Faculty: ER. DIPTIMAYEE MOHANTY**
Week	**Class Day**	**Theory / Practical Topics**
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	1.4 Organisation of state highway department
	5th	1.4 Organisation of state highway department
2nd	**1st**	Road Geometrics2.1 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	2.2 Design and average running speed, stopping and passing sight distance
	5th	2.3 Necessity of curves, horizontal and vertical curves including transition curves and super elevation, Methods o f providing super – elevation
3rd	**1st**	2.3 Necessity of curves, horizontal and vertical curves including transition curves and super elevation, Methods o f providing super – elevation
	2nd	Road Materials 3.1 Difference types of road materials in use: soil, aggregates, and binders
	3rd	Road Materials 3.1 Difference types of road materials in use: soil, aggregates, and binders
	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
4th	**1st**	3.4 Testing aggregates: Abrasion test, impact test, crushing strength test, water absorption test & soundness test
	2nd	3.4 Testing aggregates: Abrasion test, impact test, crushing strength test, water absorption test & soundness test
	3rd	3.4 Testing aggregates: Abrasion test, impact test, crushing strength test, water absorption test & soundness test

	4th	Road Pavements 4.1 Road Pavement: Flexible and rigid pavement, their merits and demerits, typical cross-sections, functions of various components
	5th	Road Pavements 4.1 Road Pavement: Flexible and rigid pavement, their merits and demerits, typical cross-sections, functions of various components
5th	**1st**	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
	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	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
	4th	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
	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

6th	1st	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
	2nd	4.5 Surfacing: • Surface dressing (i) Premix carpet and (ii) Semi dense carpet • Bituminous concrete • Grouting
	3rd	4.5 Surfacing: • Surface dressing (i) Premix carpet and (ii) Semi dense carpet • Bituminous concrete • Grouting
	4th	4.6 Rigid Pavements
	5th	Concept of concrete roads as per IRC specifications 5 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
7th	1st	Concept of concrete roads as per IRC specifications 5 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
	2nd	Concept of concrete roads as per IRC specifications 5 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
	3rd	Concept of concrete roads as per IRC specifications 5 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	5.2 Breast Walls, Retaining walls, different types of bends

	5th	5.2 Breast Walls, Retaining walls, different types of bends
8th	**1st**	5.2 Breast Walls, Retaining walls, different types of bends
	2nd	5.2 Breast Walls, Retaining walls, different types of bends
	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
9th	**1st**	Road Drainage: 6.1 Necessity of road drainage work, cross drainage works
	2nd	Road Drainage: 6.1 Necessity of road drainage work, cross drainage works
	3rd	Road Drainage: 6.1 Necessity of road drainage work, cross drainage works
	4th	Road Drainage: 6.1 Necessity of road drainage work, cross drainage works
	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
th	**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	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

10th	**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	Road Maintenance7.1 Common types of road failures – their causes and remedies
	5th	7.1 Common types of road failures – their causes and remedies
11th	**1st**	7.1 Common types of road failures – their causes and remedies
	2nd	7.1 Common types of road failures – their causes and remedies
	3rd	7.2 Maintenance of bituminous road such as patch work and resurfacing
	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
12th	**1st**	7.3 Maintenance of concrete roads – filling cracks, repairing joints, maintenance of shoulders (berm), maintenance of traffic control devices
	2nd	7.3 Maintenance of concrete roads – filling cracks, repairing joints, maintenance of shoulders (berm), maintenance of traffic control devices
	3rd	7.3 Maintenance of concrete roads – filling cracks, repairing joints, maintenance of shoulders (berm), maintenance of traffic control devices
	4th	7.3 Maintenance of concrete roads – filling cracks, repairing joints, maintenance of shoulders (berm), maintenance of traffic control devices
	5th	7.4 Basic concept of traffic study, Traffic safety and traffic control signal
	1st	7.4 Basic concept of traffic study, Traffic safety and traffic control signal
	2nd	7.4 Basic concept of traffic study, Traffic safety and traffic control signal

13th	**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
	5th	8.1 Hot mixing plant
14th	**1st**	8.1 Hot mixing plant
	2nd	8.2 Tipper, tractors (wheel and crawler) scraper, bulldozer, dumpers, shovels, graders, roller dragline
	3rd	8.2 Tipper, tractors (wheel and crawler) scraper, bulldozer, dumpers, shovels, graders, roller dragline
	4th	8.2 Tipper, tractors (wheel and crawler) scraper, bulldozer, dumpers, shovels, graders, roller dragline
	5th	8.3 Asphalt mixer and tar boilers
15th	**1st**	8.3 Asphalt mixer and tar boilers
	2nd	8.4 Road pavers
	3rd	8.4 Road pavers
	4th	8.5 Modern construction equipments for roads
	5th	8.5 Modern construction equipments for roads