

# KIIT POLYTECHNIC, BHUBANESWAR

## LESSON PLAN Session (2022-2023)

<b>Discipline :</b> Civil Engineering	<b>Semester:</b> 4 <sup>th</sup> , S/2023	<b>Name of the Faculty:</b> Dr. Sanjukta Sahoo (Asst.professor) <b>Email:</b> sanjuktafce@kp.kiit.ac.in
<b>Subject:</b> Highway Engineering	<b>No. of Days/week:</b> 05	<b>Start Date:</b> 13/02/2023 <b>End Date:</b> 23/05/2023

Week	Class Day	Theory Topics
1st	1st	Importance of Highway transportation: importance organizations like Indian roads congress, Ministry of Surface Transport, Central Road Research Institute. Functions of Indian Roads Congress
	2nd	IRC classification of roads Organisation of state highway department
	3rd	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	Problem Practice
	5th	Design and average running speed, stopping and passing sight distance
2nd	1st	Problem Practice
	2nd	Necessity of curves, horizontal and vertical curves including transition curves and super elevation, Methods of providing super – elevation
	3rd	Problem Practice
	4th	Problem Practice
	5th	Unit-1
3rd	1st	Difference types of road materials in use: soil, aggregates, and binders Function of soil as highway Subgrade
	2nd	California Bearing Ratio: methods of finding CBR valued in the laboratory and at site and their significance
	3rd	California Bearing Ratio: methods of finding CBR valued in the laboratory and at site and their significance
	4th	Problem Practice
	5th	Review & Doubt Clearing
4th	1st	Quiz-1
	2nd	Testing aggregates: Abrasion test, impact test, crushing strength test, water absorption test & soundness test

	3rd	Testing aggregates: Abrasion test, impact test, crushing strength test, water absorption test & soundness test
	4th	Unit Test- 2
	5th	Road Pavement: Flexible and rigid pavement, their merits and demerits, typical cross-sections, functions of various components
5th	1st	Flexible pavements: Sub-grade preparation: Setting out alignment of road, setting out bench marks
	2nd	control pegs for embankment and cutting, borrow pits, making profile of embankment
	3rd	construction of embankment, compaction, stabilization, preparation of subgrade
	4th	construction of embankment, compaction, stabilization, preparation of subgrade
	5th	methods of checking camber, gradient and alignment as per recommendations of IRC, equipment used for subgrade preparation
6th	1st	Unit Test-3
	2nd	Sub base Course: Necessity of sub base, stabilized sub base, purpose of stabilization (no designs)
	3rd	Types of stabilization <ul style="list-style-type: none"> <li>● Mechanical stabilization</li> <li>● Lime stabilization</li> </ul>
	4th	<ul style="list-style-type: none"> <li>● Cement stabilization</li> <li>● Fly ash stabilization</li> </ul>
	5th	Base Course: Preparation of base course, Brick soling, stone soling and metalling,
7th	1st	Water Bound Macadam and wet-mix Macadam, Bituminous constructions: Different types
	2nd	Surfacing: <ul style="list-style-type: none"> <li>● Surface dressing <ul style="list-style-type: none"> <li>(i) Premix carpet and (ii) Semi dense carpet</li> </ul> </li> <li>● Bituminous concrete</li> </ul> Grouting
	3rd	Unit Test-4
	4th	Rigid Pavements: Concept of concrete roads as per IRC specifications
	5th	Introduction: Typical cross-sections showing all details of a typical hill road in cut, partly in cutting and partly in filling
8th	1st	Breast Walls, Retaining walls
	2nd	Different types of bend
	3rd	Necessity of road drainage work, cross drainage works Surface and sub-surface drains and storm water drains.
	4th	Review & Discussion

	5th	Quiz-2
9th	1st	Necessity of road drainage work, cross drainage works Surface and sub-surface drains and storm water drains.
	2nd	Location, spacing and typical details of side drains
	3rd	side ditches for surface drainage
	4th	Intercepting drains, pipe drains in hill roads
	5th	details of drains in cutting embankment, typical cross sections
10th	1st	Review and Discussion
	2nd	Unit Test- 5
	3rd	Common types of road failures – their causes and remedies
	4th	Common types of road failures – their causes and remedies
	5th	Maintenance of bituminous road such as patch work and resurfacing
11th	1st	Maintenance of concrete roads – filling cracks, repairing joints,
	2nd	maintenance of shoulders (berm), maintenance of traffic control devices
	3rd	maintenance of shoulders (berm), maintenance of traffic control devices
	4th	Basic concept of traffic study, Traffic safety
	5th	Traffic control signal
12th	1st	Quiz-3
	2nd	Unit Test-6
	3rd	Preliminary ideas of the following plant and equipment: Hot mixing plant
	4th	Tipper, tractors (wheel and crawler) scraper
	5th	Review & Discussion
13th	1st	graders, roller dragline
	2nd	bulldozer, dumpers, shovels
	3rd	graders, roller drag
	4th	Review & Discussion
	5th	Asphalt mixer and tar boilers
14th	1st	Road pavers
	2nd	Modern construction equipments for roads
	3rd	Modern construction equipments for roads
	4th	Review & Discussion
	5th	Unit Test-7
15th	1st	Quiz-4
	2nd	Previous years Q&A Discussion
	3rd	Doubt Clearing

	4th	Previous years Q&A Discussion
	5th	Doubt Clearing