

**GOVERNMENT POLYTECHNIC JAJPUR**

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**DEPARTMENT OF CIVIL ENGINEERING**

**LESSON PLAN**

<b>Discipline:</b> Civil Engg	<b>Semester:</b> 4th	<b>Name of the Teaching faculty:</b> Nirupama Sahoo
<b>Subject:</b> Highway Engg Th-4	<b>No of Days/Week class allotted:</b> 5 days	<b>Semester from Date:</b> 10/03/2022 to <b>Date:</b> 30/06/2022 <b>No of weeks:</b> 15
<b>Week</b>	<b>Class Day</b>	<b>Topics</b>
1st	1st	<b>Introduction</b> Importance of Highway transportation: importance organizations like Indian roads congress
	2nd	Ministry of Surface Transport, Central Road Research Institute.
	3rd	Functions of Indian Roads Congress
	4th	IRC classification of roads
	5th	Organisation of state highway department
2nd	1st	<b>Road Geometrics</b> Glossary of terms used in geometric and their importance
	2nd	Glossary of terms used in geometric and their importance
	3rd	right of way, formation width
	4th	road margin, road shoulder, carriage way, side slopes, kerbs, formation level
	5th	road margin, road shoulder, carriage way, side slopes, kerbs, formation level
3rd	1st	road margin, road shoulder, carriage way, side slopes, kerbs, formation level
	2nd	camber and gradient
	3rd	camber and gradient
	4th	Design and average running speed, stopping and passing sight distance
	5th	Design and average running speed, stopping and passing sight distance
4th	1st	Design and average running speed, stopping and passing sight distance
	2nd	Design and average running speed, stopping and passing sight distance
	3rd	Necessity of curves, horizontal and vertical curves including transition curves
	4th	Necessity of curves, horizontal and vertical curves including transition curves
	5th	Necessity of curves, horizontal and vertical curves including transition curves
5th	1st	Necessity of curves, horizontal and vertical curves including transition curves

	2nd	Necessity of curves, horizontal and vertical curves including transition curves
	3rd	Necessity of curves, horizontal and vertical curves including transition curves
	4th	super elevation, Methods of providing super – elevation
	5th	super elevation, Methods of providing super – elevation
6th	1st	<b>Road Materials</b> Difference types of road materials in use: soil, aggregates, and binders
	2nd	Difference types of road materials in use: soil, aggregates, and binders
	3rd	Function of soil as highway Subgrade
	4th	California Bearing Ratio: methods of finding CBR valued in the laboratory and at site and their significance
	5th	California Bearing Ratio: methods of finding CBR valued in the laboratory and at site and their significance
7th	1st	Testing aggregates: Abrasion test, impact test, crushing strength test, water absorption test & soundness test
	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	Testing aggregates: Abrasion test, impact test, crushing strength test, water absorption test & soundness test
	5th	<b>Road Pavements</b> Road Pavement: Flexible and rigid pavement, their merits and demerits, typical cross-sections
8th	1st	functions of various components Flexible pavements
	2nd	Sub-grade preparation: Setting out alignment of road, setting out bench marks, control pegs for embankment and cutting, borrow pits, making profile of embankment
	3rd	Sub-grade preparation: Setting out alignment of road, setting out bench marks, control pegs for embankment and cutting, borrow pits, making profile of embankment
	4th	construction of embankment, compaction, stabilization, preparation of subgrade, methods of checking camber
	5th	gradient and alignment as per recommendations of IRC, equipment used for subgrade preparation
9th	1st	Sub base Course: Necessity of sub base, stabilized sub base, purpose of stabilization (no designs)
	2nd	Types of stabilization <input type="checkbox"/> Mechanical stabilization <input type="checkbox"/> Lime stabilization <input type="checkbox"/> Cement stabilization <input type="checkbox"/> Fly ash stabilization
	3rd	Base Course: Preparation of base course, Brick soling, stone soling and metalling
	4th	Water Bound Macadam and wet-mix Macadam, Bituminous constructions: Different types
	5th	Surfacing: Surface dressing

		(i) Premix carpet and (ii) Semi dense carpet
10th	1st	Bituminous concrete □ Grouting
	2nd	Rigid Pavements: Concept of concrete roads as per IRC specifications
	3rd	<b>Hill Roads:</b> Introduction: Typical cross-sections showing all details of a typical hill road in cut, partly in cutting and partly in filling
	4th	Introduction: Typical cross-sections showing all details of a typical hill road in cut, partly in cutting and partly in filling
	5th	Introduction: Typical cross-sections showing all details of a typical hill road in cut, partly in cutting and partly in filling
11th	1st	Introduction: Typical cross-sections showing all details of a typical hill road in cut, partly in cutting and partly in filling
	2nd	Breast Walls, Retaining walls, different types of bends
	3rd	Breast Walls, Retaining walls, different types of bends
	4th	Breast Walls, Retaining walls, different types of bends
	5th	<b>Road Drainage:</b> Necessity of road drainage work, cross drainage works
12th	1st	Surface and sub-surface drains and storm water drains
	2nd	Surface and sub-surface drains and storm water drains
	3rd	Location, spacing and typical details of side drains, side ditches for surface drainage
	4th	Location, spacing and typical details of side drains, side ditches for surface drainage
	5th	intercepting drains, pipe drains in hill roads
13th	1st	details of drains in cutting embankment, typical cross sections.
	2nd	<b>Road Maintenance :</b> Common types of road failures – their causes and remedies
	3rd	Maintenance of bituminous road such as patch work and resurfacing
	4th	Maintenance of bituminous road such as patch work and resurfacing
	5th	Maintenance of concrete roads – filling cracks, repairing joints, maintenance of shoulders (berm), maintenance of traffic control devices
14th	1st	Maintenance of concrete roads – filling cracks, repairing joints, maintenance of shoulders (berm), maintenance of traffic control devices
	2nd	Basic concept of traffic study, Traffic safety and traffic control signal
	3rd	Basic concept of traffic study, Traffic safety and traffic control signal
	4th	<b>Construction equipments:</b> Preliminary ideas of the following plant and equipment
	5th	Hot mixing plant
15th	1st	Tipper, tractors (wheel and crawler) scraper, bulldozer, dumpers, shovels, graders, roller dragline
	2nd	Asphalt mixer and tar boilers
	3rd	Road pavers
	4th	Modern construction equipments for roads

	5th	Modern construction equipments for roads
16th	1st	CLASS TEST 3, PREVIOUS YEAR QUESTIONS, QUIZ

**LearningResources:**

Sl No.	Author Name	Name of the Book
1	S.K.Khanna & C.E.G. Justo	Highway Engineering
2	S.P.Chandola	A Text Book Of Transportation Engineering
3	S.P.Bindra	A course on Highway engineering

Nirupama Sahoo  
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