

# Badriprasad Institute of Technology, Sambalpur

## Lesson plan for Theory -4, Highway Engineering

Semester & Branch : 4th Sem Civil Engineering

Name of the faculty : Mrs. Swagatika Panda

Total Periods-60

No of periods /week-4

WEEK	CLASS DAY	THEORY TOPICS
		<b>Introduction</b>
1ST	1st	Importance of Highway transportation: importance organizations like Indian roads congress, Ministry of Surface Transport, Central Road Research Institute.
	2nd	Continue of 1st class
	3rd	Functions of Indian Roads Congress
	4th	IRC classification of roads
2ND	1st	Organisation of state highway department
	2nd	Continue of 1st class
	3rd	<b>Road Geometrics</b> Glossary of terms used in geometric and their importance, right of way, formation width,
	4th	Continue of 3rd class
3RD	1st	Continue of 4th class
	2nd	road margin, road shoulder, carriage way,
	3rd	side slopes, kerbs, formation level, camber and gradient
	4th	Continue of 3rd class
4TH	1st	Design and average running speed, stopping and passing sight distance
	2nd	Continue of 1st class
	3rd	Continue of 2nd class
	4th	Continue of 3rd class
5TH	1st	Continue of 4th class
	2nd	Necessity of curves, horizontal and vertical curves including transition curves and super elevation, Methods of providing super – elevation
	3rd	Continue of 2nd class
	4th	Continue of 3rd class
6TH	1st	<b>Road Materials</b> Difference types of road materials in use: soil, aggregates, and binders
	2nd	Function of soil as highway Subgrade
	3rd	California Bearing Ratio: methods of finding CBR valued in the laboratory and at site and their significance
	4th	Testing aggregates: Abrasion test, impact test, crushing strength test, water absorption test & soundness test
7TH	1st	Continue of 4th class
	2nd	Continue of 1st class
	3rd	<b>Road Pavements</b> Road Pavement: Flexible and rigid pavement, their merits and demerits, typical cross-sections, functions of various components
	4th	Flexible pavements:

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8TH	1st	<b>Sub-grade preparation:</b> Setting out alignment of road, setting out bench marks, control pegs for embankment and cutting, borrow pits,
	2nd	making profile of embankment, construction of embankment, compaction, stabilization, preparation of subgrade,
	3rd	methods of checking camber, gradient and alignment as per recommendations of IRC,
	4th	equipment used for subgrade preparation
9TH	1st	<b>Sub base Course:</b> Necessity of sub base, stabilized sub base, purpose of stabilization (no designs)
	2nd	Types of stabilization
	3rd	Mechanical stabilization
	4th	Lime stabilization
10TH	1st	Cement stabilization
	2nd	Fly ash stabilization
	3rd	<b>Base Course:</b> Preparation of base course, Brick soling, stone soling and metalling, Water Bound Macadam and wet-mix Macadam, Bituminous constructions: Different types
	4th	Continue of 4th class
11TH	1st	<b>Surfacing:</b> Surface dressing (i) Premix carpet and (ii) Semi dense carpet
	2nd	Bituminous concrete
	3rd	Grouting
	4th	<b>Rigid Pavements:</b> Concept of concrete roads as per IRC specifications
12TH	1st	<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
	2nd	Breast Walls, Retaining walls, different types of bends
	3rd	<b>Road Drainage:</b> Necessity of road drainage work, cross drainage works
	4th	Surface and sub-surface drains and storm water drains. Location, spacing and typical details of side drains,
13TH	1st	<b>Road Maintenance :</b> Common types of road failures – their causes and remedies
	2nd	Maintenance of bituminous road such as patch work and resurfacing
	3rd	Maintenance of concrete roads – filling cracks, repairing joints,
	4th	maintenance of shoulders (berm), maintenance of traffic control devices

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14TH	1st	Basic concept of traffic study, Traffic safety and traffic control signal
	2nd	<b>Construction equipments:</b>
		Preliminary ideas of the following plant and equipment:
	3rd	Hot mixing plant
4th	Tipper, tractors (wheel and crawler) scraper, bulldozer,	
15th	1st	dumpers, shovels, graders, roller dragline
	2nd	Asphalt mixer and tar boilers
	3rd	Road pavers
	4th	Modern construction equipments for roads.

Sign of Faculty

Sign of HOD