

# LESSON PLAN OF 4<sup>TH</sup> SEMESTER CIVIL ENGINEERING

Discipline (CIVIL)	Semester: 4 <sup>TH</sup>	Name of the Teaching Faculty: HARAPRIYABADANAYAK	
Subject (HIGHWAY ENGINEERING)	No of Days/ per Week Class Allotted : 05	Semester From: 10.3.2022	To: 10.6.2022
		No of Weeks: 12	
Week	Class Day	Theory/ Practical Topics	
1 <sup>st</sup>	1 <sup>st</sup>	<b>1.0 Introduction</b>	
	2 <sup>nd</sup>	1.1 Importance of Highway transportation	
	3 <sup>rd</sup>	1.1 Importance organizations like Indian roads congress, Ministry of Surface Transport, Central Road Research Institute,	
	4 <sup>th</sup>	1.2 Functions of Indian Roads Congress	
	5 <sup>th</sup>	1.3 IRC classification of roads	
2 <sup>nd</sup>	1 <sup>st</sup>	1.4 Organisation of state highway department	
	2 <sup>nd</sup>	<b>Road Geometries</b>	
	3 <sup>rd</sup>	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	
	4 <sup>th</sup>	2.2 Design and average running speed, stopping and passing sight distance	
	5 <sup>th</sup>	2.3 Necessity of curves, horizontal and vertical curves including transition curves and super elevation, Methods of providing super-elevation	
3 <sup>rd</sup>	1 <sup>st</sup>		
	2 <sup>nd</sup>		
	3 <sup>rd</sup>		
	4 <sup>th</sup>		
	5 <sup>th</sup>		
4 <sup>th</sup>	1 <sup>st</sup>	<b>Road Materials</b>	
	2 <sup>nd</sup>	3.1 Difference types of road materials in use: soil, aggregates, and binders	
	3 <sup>rd</sup>	3.2 Function of soil as highway Subgrade	
	4 <sup>th</sup>	3.3 California Bearing Ratio: methods of finding CBR valued in laboratory and at site and their significance	
	5 <sup>th</sup>	3.4 Testing aggregates: Abrasion test, impact test, crushing strength test, water absorption test & soundness test	
5 <sup>th</sup>	1 <sup>st</sup>		
	2 <sup>nd</sup>		
	3 <sup>rd</sup>	<b>Road Pavements</b>	
	4 <sup>th</sup>	4.1 Road Pavement: Flexible and rigid pavement, their merits and demerits, typical cross-sections, functions of various components	
	5 <sup>th</sup>	Flexible pavements:	
6 <sup>th</sup>	1 <sup>st</sup>	4.2 Sub-grade preparation: Setting out alignment of road, setting bench marks, control pegs for embankment and cutting, borrow pit	
	2 <sup>nd</sup>	making profile of embankment, construction of embankment,	
	3 <sup>rd</sup>	4.2 Compaction, stabilization, preparation of subgrade, methods of checking camber	
	4 <sup>th</sup>	4.2 Gradient and alignment as per recommendations of IRC, equipment use for subgrade preparation	
	5 <sup>th</sup>		
7 <sup>th</sup>	1 <sup>st</sup>	4.3 Sub base Course: Necessity of sub base, stabilized sub base, purpose of stabilization (no designs)	
	2 <sup>nd</sup>	Types of stabilization	
	3 <sup>rd</sup>	• Mechanical stabilization	
	4 <sup>th</sup>	• Lime stabilization	
	5 <sup>th</sup>	• Cement stabilization • Fly ash stabilization	

8 <sup>th</sup>	1 <sup>st</sup>	<p>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</p> <p>4.5 Surfacing:</p> <ul style="list-style-type: none"> <li>• Surface dressing (i) Premix carpet and (ii) Semi dense carpet</li> <li>• Bituminous concrete</li> <li>• Grouting</li> </ul> <p>4.6 Rigid Pavements: Concept of concrete roads as per IRC specifications</p>
	2 <sup>nd</sup>	
	3 <sup>rd</sup>	
	4 <sup>th</sup>	
	5 <sup>th</sup>	
9 <sup>th</sup>	1 <sup>st</sup>	<p><b>Hill Roads:</b></p> <p>5.1 Introduction: Typical cross-sections showing all details of a typical hill road in cut, partly in cutting and partly in filling</p> <p>5.2 Breast Walls, Retaining Walls, different types of bends</p>
	2 <sup>nd</sup>	
	3 <sup>rd</sup>	
	4 <sup>th</sup>	
	5 <sup>th</sup>	
10 <sup>th</sup>	1 <sup>st</sup>	<p><b>Road Drainage:</b></p> <p>6.1 Necessity of road drainage work, cross drainage works</p> <p>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</p> <p>6.2 Details of drains in cutting embankment, typical cross sections.</p>
	2 <sup>nd</sup>	
	3 <sup>rd</sup>	
	4 <sup>th</sup>	
	5 <sup>th</sup>	
11 <sup>th</sup>	1 <sup>st</sup>	<p><b>Road Maintenance:</b></p> <p>7.1 Common types of road failures – their causes and remedies 7.2 Maintenance of bituminous road such as patch work and resurfacing</p> <p>7.3 Maintenance of concrete roads – filling cracks, repairing joints, maintenance of shoulders (berm), maintenance of traffic control</p> <p>7.4 Basic concept of traffic study, Traffic safety and traffic control signal</p>
	2 <sup>nd</sup>	
	3 <sup>rd</sup>	
	4 <sup>th</sup>	
	5 <sup>th</sup>	
12 <sup>th</sup>	1 <sup>st</sup>	<p><b>Construction equipments:</b></p> <p>Preliminary ideas of the following plant and equipment:</p> <p>8.1 Hot mixing plant</p> <p>8.2 Tipper, tractors (wheel and crawler) scraper, bulldozer, dumpers, shovel graders, roller dragline</p> <p>8.3 Asphalt mixer and tar boilers</p> <p>8.4 Road pavers</p> <p>8.5 Modern construction equipments for roads.</p>
	2 <sup>nd</sup>	
	3 <sup>rd</sup>	
	4 <sup>th</sup>	
	5 <sup>th</sup>	
		<b>DOUBT CLEARING CLASS AND REVISION</b>

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 Signature of Principal 29/3/22

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 Signature of HOD 29/3/22

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 29/03/2022

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