

# LESSON PLAN

DEPARTMENT OF CIVIL ENGINEERING, ITT, CHOUDWAR

SUBJECT: HIGHWAY ENGINEERING

Periods: 5 per week

SEMESTER: 4th

NAME OF FACULTY: A.R.LOPAMUDRA

ACADEMIC YEAR.-2021-2022

Semester From date:

To Date:

No. of weeks: 15

Week	Class Day	Theory / Practical Topics
1st	1 <sup>st</sup>	1.Introduction Importance of Highway transportation: importance organizations like Indian roads congress, Ministry of Surface Transport, Central Road Research Institute
	2 <sup>nd</sup>	Functions of Indian Roads Congress IRC classification of roads
	3rd	Organisation of state highway department
2 <sup>nd</sup>	1 <sup>st</sup>	2. Road Geometrics 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
	2 <sup>nd</sup>	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	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
3 <sup>rd</sup>	1 <sup>st</sup>	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
	2 <sup>nd</sup>	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	Design and average running speed, stopping and passing sight distance
4 <sup>th</sup>	1 <sup>st</sup>	Design and average running speed, stopping and passing sight distance
	2 <sup>nd</sup>	Design and average running speed, stopping and passing sight distance

	3rd	Design and average running speed, stopping and passing sight distance
5 <sup>th</sup>	1 <sup>st</sup>	Necessity of curves, horizontal and vertical curves including transition curves and super elevation, Methods of providing super – elevation
	2 <sup>nd</sup>	Necessity of curves, horizontal and vertical curves including transition curves and super elevation, Methods of providing super – elevation
	3rd	Necessity of curves, horizontal and vertical curves including transition curves and super elevation, Methods of providing super – elevation
6 <sup>th</sup>	1 <sup>st</sup>	3.Road Materials Difference types of road materials in use: soil, aggregates, and binders
	2 <sup>nd</sup>	Difference types of road materials in use: soil, aggregates, and binders
	3 <sup>rd</sup>	Function of soil as highway Subgrade
7 <sup>th</sup>	1 <sup>st</sup>	California Bearing Ratio: methods of finding CBR valued in the laboratory and at site and their significance
	2 <sup>nd</sup>	Testing aggregates: Abrasion test, impact test, crushing strength test, water absorption test & soundness test
	3 <sup>rd</sup>	4.Road Pavements Road Pavement: Flexible and rigid pavement, their merits and demerits, typical cross-sections, functions of various components Flexible pavements:
8 <sup>th</sup>	1 <sup>st</sup>	Road Pavement: Flexible and rigid pavement, their merits and demerits, typical cross-sections, functions of various components Flexible pavements:
	2 <sup>nd</sup>	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	Sub base Course: Necessity of sub base, stabilized sub base, purpose of stabilization (no designs) Types of stabilization <input type="checkbox"/> Mechanical stabilization <input type="checkbox"/> Lime stabilization <input type="checkbox"/> Cement stabilization <input type="checkbox"/> Fly ash stabilization
9 <sup>th</sup>	1 <sup>st</sup>	Base Course: Preparation of base course, Brick soling, stone soling and metalling, Water Bound Macadam and wet-mix Macadam, Bituminous constructions: Different types
	2 <sup>nd</sup>	Surfacing: <input type="checkbox"/> Surface dressing (i) Premix carpet and (ii) Semi dense carpet <input type="checkbox"/> Bituminous concrete <input type="checkbox"/> Grouting
	3rd	Surfacing: <input type="checkbox"/> Surface dressin (i) Premix carpet and (ii) Semi dense carpet <input type="checkbox"/> Bituminous concrete <input type="checkbox"/> Grouting
10 <sup>th</sup>	1 <sup>st</sup>	Rigid Pavements: Concept of concrete roads as per IRC specifications
	2 <sup>nd</sup>	5. Hill Roads Introduction: Typical cross-sections showing all details of a typical hill road in cut, partly in cutting and partly in filling

	3rd	Introduction: Typical cross-sections showing all details of a typical hill road in cut, partly in cutting and partly in filling
11 <sup>th</sup>	1 <sup>st</sup>	Breast Walls, Retaining walls, different types of bends
	2 <sup>nd</sup>	Breast Walls, Retaining walls, different types of bends
	3rd	6.Road Drainage Necessity of road drainage work.
12 <sup>th</sup>	1 <sup>st</sup>	Cross drainage work, Surface and sub-surface drains and storm water drains. Location, spacing and typical details of side drains.
	2 <sup>nd</sup>	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.
	3rd	side ditches for surface drainage, intercepting drains, pipe drains in hill roads, details of drains in cutting embankment, typical cross sections.
13 <sup>th</sup>	1 <sup>st</sup>	details of drains in cutting embankment, typical cross sections.
	2 <sup>nd</sup>	7.Road Maintenance Common types of road failures – their causes and remedies
		Maintenance of bituminous road such as patch work and resurfacing 7
14 <sup>th</sup>	1 <sup>st</sup>	Maintenance of concrete roads – filling cracks, repairing joints, maintenance of shoulders (berm), maintenance of traffic control devices
	2 <sup>nd</sup>	Basic concept of traffic study, Traffic safety and traffic control signal
	3rd	8.Construction Equipments Hot mixing plant
15 <sup>th</sup>	1 <sup>st</sup>	Tipper, tractors (wheel and crawler) scraper, bulldozer, dumpers, shovels, graders, roller dragline
	2 <sup>nd</sup>	Asphalt mixer and tar boiler
	3rd	Road pavers , Modern construction equipments for roads.