

LESSON PLAN FOR HIGHWAY ENGINEERING (CREDIT -5)

Discipline Civil	Semester: 4 th	Name of teaching faculty: Abinash Biswal
Subject: SURVEYING- 1	Nos of days per week class allotted: 5	Semester from date:9.12.19 to date:31.03.20
Week	Class day	Theory topics
DEC 2 ND Week	1 ST	Introduction
	2 ND	Importance of Highway transportation: importance organizations like Indian roads congress, Ministry of Surface Transport, Central Road Research Institute
	3 RD	Functions of Indian Roads Congress
	4th	IRC classification of roads
	5th	Organization of state highway department
DEC 3 rd Week	1 ST	Road Geometrics Glossary of terms used in geometric and their importance
	2	right of way, formation width
	3	road margin, road shoulder, carriage way
	4	side slopes, kerbs,
	5	formation level
January 1 st week	1	camber
	2	gradient
	3	Design and average running speed
January 2nd week	1	stopping sight distance
	2	passing sight distance
	3	Necessity of curves
	4	horizontal curves
	5	vertical curves

January 3rd week	1	transition curves
	2	super elevation
	3	Methods of providing super – elevation
	4	Problems and solution
	5	Problems and solution
January 4th week	1	Problems and solution
	2	Problems and solution
	3	Road Materials Difference types of road materials in use: soil, aggregates,
	4	Binders
	5	Function of soil as highway Subgrade
January 5th week	1	California Bearing Ratio: methods of finding CBR valued in the laboratory and
	2	CBR at site and their significance
	3	Testing aggregates: Abrasion test,
February 2nd week	1	impact test, crushing strength test,
	2	water absorption test
	3	soundness test
	4	Road Pavements Road Pavement: Flexible and rigid pavement, their merits and demerits, typical cross-sections,
	5	functions of various components Flexible pavements:
February 3rd week	1	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,
	2	compaction, stabilization, preparation of subgrade, methods of checking camber, gradient and alignment as per recommendations of IRC, equipment used for subgrade preparation

	3	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
	4	<input type="checkbox"/> Cement stabilization <input type="checkbox"/> Fly ash stabilization
	5	Base Course: Preparation of base course, Brick soling, stone soling and metalling,
February 4th week	1	Water Bound Macadam and wet-mix Macadam, Bituminous constructions: Different types
	2	Surfacing: <input type="checkbox"/> Surface dressing (i) Premix carpet and (ii) Semi dense carpet
	3	<input type="checkbox"/> Bituminous concrete <input type="checkbox"/> Grouting
February 5th week	1	Rigid Pavements: Concept of concrete roads as per IRC specifications
	2	Hill Roads Introduction:
	3	Typical cross-sections showing all details of a typical hill road in cut, partly in cutting and partly in filling
	4	Breast Walls, Retaining walls
	5	different types of bends
March 1st week	1	Road Drainage: Necessity of road drainage work, cross drainage works
	2	Surface and sub-surface drains and storm water drains.
	3	Location, spacing and typical details of side drains,
	4	side ditches for surface drainage, intercepting drains, pipe drains in hill roads,
	5	details of drains in cutting embankment, typical cross sections.

March 2 nd week	1	Road Maintenance : Common types of road failures – their causes and remedies
	2	Maintenance of bituminous road such as patch work and resurfacing
	3	Maintenance of concrete roads – filling cracks, repairing joints, maintenance of shoulders (berm), maintenance of traffic control devices
March 3 rd week	1	Basic concept of traffic study, Traffic safety and traffic control signal
	2	Construction equipments: Preliminary ideas of the following plant and equipment:
	3	8.1 Hot mixing plant
	4	8.2 Tipper, tractors (wheel and crawler) scraper, bulldozer, dumpers, shovels, graders, roller dragline
	5	8.3 Asphalt mixer and tar boilers
March 4 th week	1	8.4 Road pavers
	2	8.5 Modern construction equipments for roads
	3	Problems and solution
	4	Problems and solution
	5	Revision and doubts