ASIAN SCHOOL OF TECHNOLOGY, BHUBANESWAR

DEPARTMENT OF CIVIL ENGINEERING

LESSON PLAN

Discipline: Civil engineering	Semester : 3rd	No. of periods available: 51	Name of Teaching Faculty: Santosh Kumar Behera
Subject: Highway Engineering	No. of Days/ per week class allotted : 4 periods per week		No. of weeks : 13
Week	Class Day		Topics to be covered
1st	1st	1	Importance of Highway transportation: importance organizations like Indian roads congress, Ministry of Surface Transport, Central Road Research Institute. Functions of Indian Roads Congress
	2nd	1	IRC classification of roads Organisation of state highway department
	3rd	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
	4th	1	Problem Practice
2nd	5th	1	Design and average running speed, stopping and passing sight distance
	6th	1	Problem Practice
	7th	1	Necessity of curves, horizontal and vertical curves including transition curves and super elevation, Methods of providing super – elevation
	8th	1	Problem Practice
3rd	9th	1	Difference types of road materials in use: soil, aggregates, and binders Function of soil as highway Subgrade
	10th	1	California Bearing Ratio: methods of finding CBR valued in the laboratory and at site and their significance
	11th	1	California Bearing Ratio: methods of finding CBR valued in the laboratory and at site and their significance
	12th	1	Problem Practice
4th	13th	1	Class Test
	14th	1	Quiz-1
	15th	1	Testing aggregates: Abrasion test, impact test,

			crushing strength test, water absorption test & soundness test
	16th	1	Testing aggregates: Abrasion test, impact test, crushing strength test, water absorption test & soundness test
5th	17th	1	
	18th	1	Road Pavement: Flexible and rigid pavement, their merits and demerits, typical cross-sections, functions of various components
	19th	1	Flexible pavements: Sub-grade preparation: Setting out alignment of road, setting out bench marks
	20th	1	control pegs for embankment and cutting, borrow pits, making profile of embankment
6th	21st	1	construction of embankment, compaction, stabilization, preparation of subgrade
	22nd	1	construction of embankment, compaction, stabilization, preparation of subgrade
	23rd	1	methods of checking camber, gradient and alignment as per recommendations of IRC, equipment used for subgrade preparation
	24th	1	
7th	25th	1	Sub base Course: Necessity of sub base, stabilized sub base, purpose of stabilization (no designs)
	26th	1	Types of stabilization ● Mechanical stabilization ● Lime stabilization
	27th	1	● Cement stabilization ● Fly ash stabilization
	28th	1	Base Course: Preparation of base course, Brick soling, stone soling and metalling,
8th	29th	1	Water Bound Macadam and wet-mix Macadam, Bituminous constructions: Different types
	30th	1	Surfacing: ● Surface dressing (i) Premix carpet and (ii) Semi dense carpet ● Bituminous concrete Grouting
	31st	1	
	32nd	1	Rigid Pavements: Concept of concrete roads as per IRC specifications
9th	33rd	1	Introduction: Typical cross-sections showing all details of a typical hill road in cut, partly in cutting and partly in filling
	34th	1	Breast Walls, Retaining walls

	35th	1	Different types of bend
	36th	1	Necessity of road drainage work, cross drainage works Surface and sub-surface drains and storm water drains.
10th	37th	1	Review & Discussion
	38th	1	Necessity of road drainage work, cross drainage works Surface and sub-surface drains and storm water drains.
	39th	1	Location, spacing and typical details of side drains
	40	1	side ditches for surface drainage
11th	41st	1	Intercepting drains, pipe drains in hill roads
	42nd	1	details of drains in cutting embankment, typical cross sections
	43rd	1	Review and Discussion
	44th	1	Common types of road failures – their causes and remedies
12th	45th	1	Common types of road failures – their causes and remedies
	46th	1	Maintenance of bituminous road such as patch work and resurfacing
	47th	1	Maintenance of concrete roads – filling cracks, repairing joints,
	48th	1	maintenance of shoulders (berm), maintenance of traffic control devices
13th	49th	1	maintenance of shoulders (berm), maintenance of traffic control devices
	50th	1	Basic concept of traffic study, Traffic safety
	51st	1	Traffic control signal
	52nd	1	Preliminary ideas of the following plant and equipment: Hot mixing plant Tipper, tractors (wheel and crawler) scraper graders, roller dragline bulldozer, dumpers, shovels graders, roller drag Asphalt mixer and tar boilers Road pavers Modern construction equipments for roads