GOVERNMENT POLYTECHNIC MEHAM

Name of Faculty: **PARVEEN BENIWAL**
Discipline: **CIVIL ENGG.**
Semester: **5th**
Subject: Highway Engg.
Lesson Plan Duration: **15weeks (Sept-Dec 2020)**
Work load (Theory/Practical) per week (in hours): Theory-04,Practical-02

WEEK	THEORY		PRACTICAL	
1ST Week	1st day	Introduction	1st day	Determination of penetration value of bitumen
	2nd day	Importance of Highway engineering		
	3rd day	Functions of IRC, CRRI, MORT&H, NHAI		
	4th day	IRC classification of roads		
	5th day	Glossary of terms used in road geo-metrics and their importance: Right of way		
2nd Week	1st day	Road margin, road shoulder, carriage way, side slopes, kerbs, formation levels, camber and gradient	1st day	Determination of softening point of bitumen
	2nd day	Average running speed, stopping and passing sight distance		
	3rd day	Necessity of curves, horizontal and vertical curves including transition curves.		
	4th day	Super elevation and methods of providing super elevation		

	5th day	Sketch of typical cross-sections in cutting and filling on straight alignment and at a curve		
3rd Week	1st day	Highway Surveys and Plan	1st day	Determination of ductility of bitumen
	2nd day	Topographic map, reading the data given on a topographic map		
	3rd day	Basic considerations governing alignment for a road in plain and hilly area		
	4th day	Highway location; marking of alignment		
	5th day	Topographic map, reading the data given on a topographic map		
4th Week	1st day	Road Materials	1st day	Determination of impact value of the road aggregate
	2nd day	Different types of road materials in use; soil, aggregate, binders – bitumen, cutback, Emulsion and Modified Bitumen (CRMB, PMB)		
	3rd day	Binders: Common binders; bitumen, properties as per BIS specifications, penetration		
	4th day	softening point, ductility and viscosity test of bitumen, procedures		
	5th day	cut back and emulsion and their uses, Bitumen modifiers		
5th Week	1st day	Doubt of Unit 1st and 2nd will be taken.	1st day	Revised of Practical No. 1

	2nd day	Road Pavements		
	3rd day	Road pavement: Flexible and rigid pavement, their merits and demerits, typical cross-sections		
	4th day	Introduction to California Bearing Ratio, method of finding CBR value and its significance		
	5th day	Sub-grade preparation: Setting out alignment of road, setting out bench marks, control pegs for embankment and cutting		
6th Week	1st day	Introduction to Sub Base Course and Base Course	1st day	Revised of practical no. 2
	2nd day	Granular base course: (i) Water Bound Macadam (WBM) (ii) Wet Mix Macadam (WMM)		
	3rd day	Bitumen Courses: (i) Bituminous Macadam (ii) Dense Bituminous Macadam (DBM)		
	4th day	Meaning, conditions/situations of occurrence with emphasis on practical significance of		
	5th day	*Methods of construction as per MORT&H		
7th Week	1st day	Surfacing: a) * Types of surfacing i) Prime coat and tack coat ii) Surface dressing with seal coat	1st day	Revised of Practical no. 3
	2nd day	Methods of constructions as per MORT&H specifications and quality		

		control.		
	3rd day	Rigid Pavements:		
	4th day	Construction of concrete roads as per IRC specifications: Form work laying, mixing and placing the concrete		
	5th day	compacting and finishing, curing, joints in concrete pavement, equipment used		
8th Week	1st day	Doubt of Unit 3rd and 4th will be taken.	1st day	Determination of abrasion value (Los Angeles') of road aggregate
	2nd day	Introduction: Typical cross-sections showing all details of a typical hill road, partly in cutting and partly in filling		
	3rd day	Special problems of hill areas		
	4th day	Road Drainage		
	5th day	Necessity of road drainage work, cross drainage works		
9th Week	1st day	Surface and subsurface drains and storm water drains. Location, spacing and typical	1st day	Determination of the California bearing ratio (CBR) for the sub-grade soil
	2nd day	side ditches for surface drainage. Intercepting drains, pipe drains in hill roads,		
	3rd day	Road Maintenance		
	4th day	Common types of road failures of flexible pavements: Pot hole, rutting, alligator cracking		
	5th day	Maintenance of bituminous		

		road such as seal-coat, patch-work and recarpetng.		
10th Week	1st day	Maintenance of concrete roads-filling cracks, repairing joints, maintenance of shoulders (berms), maintenance of traffic control devices	1st day	Visit to Hot mix plant
	2nd day	Doubt of Unit 5th and 6th will be taken.		
	3rd day	Test of Unit 1st and 2nd.		
	4th day	Road Construction Equipment		
	5th day	Output and use of the following plant and equipment		
11th Week	1st day	Hot mix plant	1st day	Visit to highway construction site for demonstration of operation of Tipper, tractors (wheel and crawler), scraper, bulldozer, dumpers, shovels, grader, roller, dragline, road pavers, JCB etc.
	2nd day	Tipper, tractors (wheel and crawler) scraper, bulldozer, dumpers, shovels, grader, roller, dragline		
	3rd day	Asphalt mixer and tar boilers		
	4th day	Road pavers		
	5th day	Doubt of Unit 7th and 8th will be taken.		
12th Week	1st day	Test of Unit 3rd and 4th.	1st day	Mixing and spraying equipment
	2nd day	Airport Engineering		
	3rd day	Necessity of study of airport engineering, aviation transport scenario in India.		
	4th day	Doubt of unit 9th will be taken.		

	5th day	Test of Unit 5th and 6th.		
13th Week	1st day	Factors to be considered while selecting a site for an airport with respect to zoning laws.	1st day	A compulsory visit to Ready Mix Concrete plant.
	2nd day	Test of Unit 5th and 6th		
	3rd day	Introduction to Runways, Taxiways and Apron		
	4th day	Doubt of 10th will be taken.		
	5th day	Test of unit 7th.		
14th Week	1st day	Revised of Unit 1st and 2nd.	1st day	Revised the No. 4th.
	2nd day	Test of unit 8.		
	3rd day	Revised of Unit 3rd and 4th.		
	4th day	Test of Unit 9th.		
	5th day	Revision of Unit 4th and 5th		
15th Week	1st day	Test of unit 10th.	1st day	Revised the No. 5th.
	2nd day	Revised of unit 5th and 6th.		
	3rd day	Revision of Unit 7th		
	4th day	Revision of Unit 8th		
	5th day	Revision of Unit 9th and 10th		