

Government Polytechnic Asthawan, Nalanda

LECTURE PLAN

Name of the Faculty : Saurabh Kumar

Department : Civil Engineering

Email-id and Mobile Number : nce08saurabh@gmail.com and Mob.- 9504784248

Semester : 5th

Subject : Highway Engineering (1615504)

Unit	Week	Lecture No (1 Hr Each)	Topic of Class & Discussions	Mode of Teaching
Unit 1 Road Engineering	1	1	Introduction of Highway, Importance of road in India.	Lecture /PDF /Video
		2	Classification of roads according to Nagpur plan (Location and function), and third road development plan	Lecture /PDF /Video
		3	Classification of roads according to Traffic and tonnage, Classification of urban roads.	Lecture /PDF /Video
Unit 2 Investigation for Road Project	2	4	Reconnaissance survey, Preliminary survey and Location survey for a road project, Detailed survey for cross drainage- L-section and C/S sections.	Lecture /PDF /Video
		5	Fixing the alignment of road, factors affecting alignment of road, Drawings required for road project- Key map, Index map, Preliminary survey plan and detailed location survey plan	Lecture /PDF /Video
		6	C/S sections cross drainage work, land acquisition plan, Survey for availability of construction material, location plan of quarries.	Lecture /PDF /Video
Unit – 3 Geometric Design Of Highways	3	7	Camber- definition, purpose, types, IRC – specifications.	Lecture /PDF /Video
		8	Kerbs, road margin, road formation, right of way.	Lecture /PDF /Video
		9	Design speed- IRC – specifications	Lecture /PDF /Video
	4	10	Gradient – definition, types, IRC specification.	Lecture /PDF /Video
		11	Sight distances– definition, types, IRC specification	Lecture /PDF /Video
		12	Curves–Necessity, types– horizontal, vertical and transition curves.	Lecture /PDF /Video
	5	13	Widening of roads on curves	Lecture /PDF /Video
		14	Super Elevation – definition, formula for calculating super elevation,	Lecture /PDF /Video
		15	Minimum and maximum values of super elevation,	Lecture /PDF /Video
	6	16	Methods of providing super elevation.	Lecture /PDF /Video
		17	Sketching of standard C/S of national highway in embankment and cutting	Lecture /PDF /Video
		18	Simple problems on geometric design of road.	Lecture /PDF /Video
7	19	Types of road materials and Tests – soil, aggregates, bitumen, Cement Concrete	Lecture /PDF /Video	
	20	Test on soil sub grade- C.B.R. test, Test on Aggregate – Los Angeles abrasion, impact, and shape test.	Lecture /PDF /Video	
	21	Tests on bitumen- Penetration, Ductility and Softening point test	Lecture /PDF /Video	

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Unit - 4 Construction of Roads Pavements and materials	8	22	Pavement – objective of pavement, structure of pavement.	Lecture /PDF /Video
		23	Function of pavement components, types of pavement.	Lecture /PDF /Video
		24	Construction of earthen road – general terms used- borrows pits.	Lecture /PDF /Video
	9	25	Spoil bank, lead and lift, balancing of earthwork. Construction procedure.	Lecture /PDF /Video
		26	Soil stabilized roads – necessity, methods of soil stabilization, brief details of mechanical soil stabilization.	Lecture /PDF /Video
		27	Water bound macadam roads – materials used, size and grading of aggregates and screening	Lecture /PDF /Video
	10	28	Construction procedure including precautions in rolling, bitumen, asphalt, emulsion, cutback, tar,	Lecture /PDF /Video
		29	Common grades adopted for construction. Types of bituminous surface – prime coat, tack coat, seal coat,	Lecture /PDF /Video
		30	Surface dressing – procedure of construction bituminous penetration macadam.	Lecture /PDF /Video
	11	31	Bitumen/Tar carpets – procedure of construction, Cement concrete pavements- Construction procedure and equipments,	Lecture /PDF /Video
32		Construction joints, joint filler, joint sealer.	Lecture /PDF /Video	
Unit - 5 Traffic Engineering	11	33	Traffic volume study	Lecture /PDF /Video
	12	34	Traffic control devices-road signs, marking,	Lecture /PDF /Video
		35	Traffic Signals and Traffic Island	Lecture /PDF /Video
		36	.Road intersections- intersections at grade and grade separator intersections	Lecture /PDF /Video
	13	37	Road accident. Building code IS:1904	Lecture /PDF /Video
		38	Definition of active earth pressure and passive earth pressure, structures subjected to earth pressure in the field.	Lecture /PDF /Video
Unit - 6 Hill Roads	13	39	Parts and functions of hill road components.	Lecture /PDF /Video
	14	40	Types of curves, Hill road formation	Lecture /PDF /Video
		41	Land slides- causes and prevention.	Lecture /PDF /Video
		42	Structures- drainage structures.	Lecture /PDF /Video
Unit - 7 Drainage of Roads	15	43	Surface drainage – side gutter	Lecture /PDF /Video
		44	Catch water drains, surface drainage.	Lecture /PDF /Video
		45	Sub-surface drainage –Longitudinal drains and cross drains.	Lecture /PDF /Video
Unit - 8 Maintenance and Repairs of Roads	16	46	Necessity of maintenance of roads.	Lecture /PDF /Video
		47	Classification of maintenance operation – ordinary, routine and periodic maintenance.	Lecture /PDF /Video
		48	Maintenance of W.B.M., bituminous and cement concrete roads.	Lecture /PDF /Video