

GOVERNMENT POLYTECHNIC NAWADA

LESSON PLAN FOR HIGHWAY ENGINEERING (1615504)

Name of Faculty- RAHUL

Branch-Civil Engineering
Semester-5th

WEEK	LECTURE/ DAY	TOPIC /ASSIGNMENT/ TEST
1	1	Road Engineering : Importance of road in India
	2	Classification of roads according to Nagpur plan (Location and function),
	3	Third road development plan. Traffic and tonnage, Classification of urban roads.
	4	Investigation for Road Project- Reconnaissance survey, Preliminary survey and Location survey for a road project. Detailed survey for cross drainage- L-section and C/S sections. Fixing the alignment of road, factors affecting alignment of road.
2	5	Drawings required for road project- Key map, Index map, Preliminary survey plan and detailed location survey plan, L- section and C/S sections cross drainage work, land acquisition plan.
	6	Survey for availability of construction material, location plan of quarries.
	7	Camber- definition, purpose, types, IRC – specifications. Kerbs, road margin, road formation, right of way.
	8	Design speed- IRC – specifications
3	9	Gradient – definition, types, IRC specification
	10	Sight distances– definition, types, IRC specification
	11	Curves–Necessity, types– horizontal, vertical and transition curves
	12	Widening of roads on curves. Super Elevation – definition
4	13	Formula for calculating super elevation, minimum and maximum values of super elevation,
	14	Sketching of standard C/S of national highway in embankment and cutting.
	15	Simple problems on geometric design of road.
	16	Problems on geometric design of road.
5	17	Revision of geometric design of road
	18	Test and discussion
	19.	Construction of Roads Pavements and materials Types of road materials and Tests – soil, aggregates, bitumen, Cement Concrete.
	20	Test on soil sub grade- C.B.R. test, Test on Aggregate – Los Angeles
6	21	Test on soil sub grade-- abrasion, impact, and shape test
	22	Tests on bitumen- Penetration, Ductility and Softening point test.
	23	Pavement – objective of pavement, structure of pavement
	24	Function of pavement components, types of pavement.
7	25	Construction of earthen road – general terms used- borrows pits, spoil bank
	26	lead and lift, balancing of earthwork. Construction procedure
	27	Soil stabilized roads – necessity, methods of soil stabilization, brief details of mechanical soil stabilization
	28	Water bound macadam roads – materials used, size and grading of aggregates and screening, construction procedure including precautions in rolling.

8	29	Construction of bituminous roads. Terms used–bitumen, asphalt, emulsion, cutback, tar, common grades adopted for construction.
	30	Types of bituminous surface – prime coat, tack coat, seal coat, Surface
	31	dressing – procedure of construction bituminous penetration macadam, and Bitumen/Tar carpets – procedure of construction
	32	Cement concrete pavements- Construction procedure and equipments, Construction joints, joint filler, joint sealer.
9	33	Traffic Engineering- Traffic volume study
	34	Traffic control devices-road signs, marking, Signals, Traffic island.
	35	Road intersections- intersections at grade and grade separator intersections.
	36	Road accident. Building code IS:1904
10	37	Definition of active earth pressure and passive earth pressure, structures subjected to earth pressure in the field
	38	Test and discussion
	39	Hill Roads Parts and functions of hill road components
	40	types of curves
	41	Hill road formation.
	42	Landslides- causes and prevention. Structures- drainage structures.
	43	Drainage of Roads Surface drainage – side gutter
	44	catch water drains, surface drainage.
	45	Sub-surface drainage –Longitudinal drains and cross drains.
	46	Maintenance and Repairs of Roads Necessity of maintenance of roads
	47	Classification of maintenance operation – ordinary, routine and periodic maintenance.
	48	Maintenance of W.B.M., bituminous and cement concrete road

