SPINTRONIC TECHNOLOGY AND ADVANCE RESEARCH,BHUBANESWAR

SUBJECT: HIGHWAY ENGINEERING

LESSON PLAN SESSION- 2023-24, SEMESTER - 4TH

SEMESTER 4TH DEPT:CIVILENGINEERING

NAME OF THE FACULTY: S.S.DASH

SL. NO.	WEEK	TOPICS PLANNED TO BE COVERED	No.of Periods	Cumulative no. periods	REMARK
01	01	Introduction 1.1 Importance of Highway transportation: importance organizations like Indian roads congress, Ministry of Surface Transport, Central Road Research Institute	1	1	
		Functions of Indian Roads Congress	1	2	
		IRC classification of roads	1	3	
		Organisation of state highway department	1	4	
		Organisation of state highway department	1	5	
02	02	Road Geometrics 2.1 Glossary of terms used in geometric and their importance	1	6	
		Glossary of terms used in geometric and their importance	1	7	
		Glossary of terms used in geometric and their importance	1	8	
		right of way, formation width, road margin, road shoulder, carriage way, side slopes, kerbs, formation level, camber and gradient	1	9	
		right of way, formation width, road margin, road shoulder, carriage way, side slopes, kerbs, formation level, camber and gradient	1	10	
03	03	right of way, formation width, road margin, road shoulder, carriage way, side slopes, kerbs, formation level, camber and gradient	1	11	
		right of way, formation width, road margin, road shoulder, carriage way, side slopes, kerbs, formation level, camber and gradient	1	12	
		Design and average running speed, stopping and passing sight distance	1	13	
		Design and average running speed, stopping and passing sight distance	1	14	
		Design and average running speed, stopping and passing sight distance	1	15	
04	04	Design and average running speed, stopping and passing sight distance	1	16	
		Design and average running speed, stopping and passing sight distance	1	17	
		Necessity of curves, horizontal and vertical curves including transition curves and super elevation, Methods o f providing super – elevation	1	18	
		Necessity of curves, horizontal and vertical curves including transition curves and super elevation, Methods o f providing super – elevation	1	19	
		Necessity of curves, horizontal and vertical curves including	1	20	
		transition curves and super elevation, Methods o f providing super – elevation	1	21	
		Necessity of curves, horizontal and vertical curves including transition curves and super elevation, Methods o f providing super – elevation	1	22	

05	05	Necessity of curves, horizontal and vertical curves including transition curves and super elevation,	1	23	
		Methods o f providing super – elevation	1	24	
		Methods o f providing super – elevation	1	25	
		Methods o f providing super – elevation	1	26	
06	06	Road Materials 3.1 Difference types of road materials in use: soil, aggregates, and binders	1	27	
		Difference types of road materials in use: soil, aggregates, and binders	1	28	
		California Bearing Ratio: methods of finding CBR valued in the laboratory and at site and their significance	1	29	
		California Bearing Ratio: methods of finding CBR valued in the laboratory and at site and their significance	1	30	
		California Bearing Ratio: methods of finding CBR valued in the laboratory and at site and their significance	1	31	
07	07	Testing aggregates: Abrasion test, impact test, crushing strength test	1	32	
		water absorption test & soundness test	1	33	
		water absorption test & soundness test	1	34	
		water absorption test & soundness test	1	35	
		Road Pavements 4.1 Road Pavement: Flexible and rigid pavement, their merits and demerits, typical cross-sections, functions of various components	1	36	
08	08	Flexible pavements: 4.2 Sub-grade preparation: Setting out alignment of road, setting out bench marks, control pegs for embankment and cutting, borrow pits, making profile of embankment,	1	37	
		Sub base Course: Necessity of sub base, stabilized sub base, purpose of stabilization (no designs) Types of stabilization Mechanical stabilization	1	38	
		Lime stabilization	1	39	
		Cement stabilization	1	40	
		Fly ash stabilization	1	41	
09	09	Base Course: Preparation of base course, Brick soling, stone soling and metalling,	1	42	
		Water Bound Macadam and wet-mix Macadam, Bituminous constructions: Different types	1	43	
		Water Bound Macadam and wet-mix Macadam, Bituminous constructions: Different types	1	44	
		Water Bound Macadam and wet-mix Macadam, Bituminous constructions: Different types	1	45	
		Surfacing: • Surface dressing (i) Premix carpet and (ii) Semi dense carpet • Bituminous concrete • Grouting	1	46	
10	10	Surfacing: • Surface dressing (i) Premix carpet and (ii) Semi dense carpet • Bituminous concrete • Grouting	1	47	
		Rigid Pavements: Concept of concrete roads as per IRC specifications	1	48	
		Hill Roads: 5.1 Introduction: Typical cross-sections showing all details of a typical hill road in cut, partly in cutting and partly in filling	1	49	
		Typical cross-sections showing all details of a typical hill road	1	50	

		in cut			
		Typical cross-sections showing all details of a typical hill road in cut	1	51	
11	11	Breast Walls, Retaining walls, different types of bends	1	52	
		Breast Walls, Retaining walls, different types of bends	1	53	
		Breast Walls, Retaining walls, different types of bends	1	54	
		Breast Walls, Retaining walls, different types of bends	1	55	
		Road Drainage: 6.1 Necessity of road drainage work, cross drainage works 6.2,	1	56	
12	12	Necessity of road drainage work, cross drainage works	1	57	
		Surface and sub-surface drains and storm water drains	1	58	
		Location, spacing and typical details of side drains, side ditches for surface drainage, intercepting drains	1	59	
		Location, spacing and typical details of side drains, side ditches for surface drainage, intercepting drains	1	60	
		pipe drains in hill roads, details of drains in cutting embankment, typical cross sections.	1	61	
13	13	pipe drains in hill roads, details of drains in cutting embankment, typical cross sections.	1	62	
		Road Maintenance : 7.1 Common types of road failures – their causes and remedies	1	63	
		Common types of road failures – their causes and remedies	1	64	
		Maintenance of bituminous road such as patch work and resurfacing	1	65	
		maintenance of traffic control devices ,control signal	1	66	
14	14	Maintenance of bituminous road such as patch work and resurfacing	1	67	
		Maintenance of concrete roads – filling cracks, repairing joints, maintenance of shoulders (berm),	1	68	
		Basic concept of traffic study, Traffic safety and traffic	1	69	
		Construction equipments: Preliminary ideas of the following plant and equipment	1	70	
15	15	Hot mixing plant	1	71	
		Tipper, tractors (wheel and crawler) scraper, bulldozer, dumpers, shovels, graders, roller dragline	1	72	
		Tipper, tractors (wheel and crawler) scraper, bulldozer, dumpers, shovels, graders, roller dragline	1	73	
		Asphalt mixer and tar boilers ,Road pavers	1	74	
		Modern construction equipments for roads	1	75	

REFERENCE BOOKS:

1. **S.K.Khanna & C.E.G . Justo : HIGHWAY ENGINEERING**
2. **S.P CHANDOLA : A Text Book Of Transportation Engineering : S.Chand**

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