SPINTRONIC TECHNOLOGY AND ADVANCE RESEARCH,BHUBANESWAR

SUBJECT: HIGHWAY ENGINEERING

LESSON PLAN SESSION- 2024-25, SEMESTER - 4TH

SEMESTER 4TH DEPT:CIVILENGINEERING

NAME OF THE FACULTY: SASMITA SAHOO

SL. NO.	WEEK	TOPICS PLANNED TO BE COVERED	No.of Periods	Cumulative no. periods
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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