

# JHARSUGUDA ENGINEERING SCHOOL, JHARSUGUDA

Department of Civil Engineering

4th Sem (2nd Year) Summer 2024

Course Code : 4

Course Name: **HIGHWAY ENGINEERING**

Name Of The  
Faculty:

Sr. SOUMYASAGAR TRIPATHY  
Ms JYOTSHNARANI RAUTA

Sl No	Week No	No. Of classes	Topics to be covered	Remarks
1	W1	1	1 Introduction 1.1 Importance of Highway transportation: importance organizations like Indian roads congress, Ministry of Surface Transport, Central Road Research Institute	
2		1	1 Introduction 1.1 Importance of Highway transportation: importance organizations like Indian roads congress, Ministry of Surface Transport, Central Road Research Institute	
3		1	1 Introduction 1.1 Importance of Highway transportation: importance organizations like Indian roads congress, Ministry of Surface Transport, Central Road Research Institute	
		1	1 Introduction 1.1 Importance of Highway transportation: importance organizations like Indian roads congress, Ministry of Surface Transport, Central Road Research Institute	
4		1	1.2 Functions of Indian Roads Congress	
5		1	1.3 IRC classification of roads	
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		1	1.4 Organisation of state highway department	
8	W2	1	2.1 Glossary of terms used in geometric and their importance, right of way, formation width, road margin, road shoulder, carriage way, side slopes, kerbs, formation level, camber and gradient	
9	W3	1	2.1 Glossary of terms used in geometric and their importance, right of way, formation width, road margin, road shoulder, carriage way, side slopes, kerbs, formation level, camber and gradient	
		1	2.1 Glossary of terms used in geometric and their importance, right of way, formation width, road margin, road shoulder, carriage way, side slopes, kerbs, formation level, camber and gradient	
10		1	2.2 Design and average running speed, stopping and passing sight distance	
11		1	2.2 Design and average running speed, stopping and passing sight distance	
12		1	2.3 Necessity of curves, horizontal and vertical curves including transition curves and super elevation, Methods of providing super – elevation	
13		1	2.3 Necessity of curves, horizontal and vertical curves including transition curves and super elevation, Methods of providing super – elevation	
14	W4	1	2.3 Necessity of curves, horizontal and vertical curves including transition curves and super elevation, Methods of providing super – elevation	

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15		1	Road Materials 3.1 Difference types of road materials in use: soil, aggregates, and binders	
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16		1	Road Materials 3.1 Difference types of road materials in use: soil, aggregates, and binders	
17		1	3.2 Function of soil as highway Subgrade	
18		1	3.3 California Bearing Ratio: methods of finding CBR valued in the laboratory and at site and their significance	
19		1	3.4 Testing aggregates: Abrasion test, impact test, crushing strength test, water absorption test & soundness test	
	W5	1	Road Pavements 4.1 Road Pavement: Flexible and rigid pavement, their merits and demerits, typical cross-sections, functions of various components	
20		1	Road Pavements 4.1 Road Pavement: Flexible and rigid pavement, their merits and demerits, typical cross-sections, functions of various components	
21		1	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, construction of embankment, compaction, stabilization, preparation of subgrade, methods of checking camber, gradient and alignment as per recommendations of IRC, equipment used for subgrade preparation	

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22	W6	1	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, construction of embankment, compaction, stabilization, preparation of subgrade, methods of checking camber, gradient and alignment as per recommendations of IRC, equipment used for subgrade preparation
23		1	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, construction of embankment, compaction, stabilization, preparation of subgrade, methods of checking camber, gradient and alignment as per recommendations of IRC, equipment used for subgrade preparation
		1	4.3 Sub base Course: Necessity of sub base, stabilized sub base, purpose of stabilization (no designs) Types of stabilization ☑ Mechanical stabilization
24		1	Lime stabilization ☑ Cement stabilization ☑ Fly ash stabilization
25		1	Lime stabilization ☑ Cement stabilization ☑ Fly ash stabilization

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26	W7	1	4.4 Base Course: Preparation of base course, Brick soling, stone soling and metalling, Water Bound Macadam and wet-mix Macadam, Bituminous constructions: Different types	
27		1	4.4 Base Course: Preparation of base course, Brick soling, stone soling and metalling, Water Bound Macadam and wet-mix Macadam, Bituminous constructions: Different types	
		1	4.5 Surfacing: Surface dressing (i) Premix carpet and (ii) Semi dense carpet .Bituminous concrete Grouting	
28		1	4.6 Rigid Pavements: Concept of concrete roads as per IRC specifications	
29	W8	1	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	
30		1	5.2 Breast Walls, Retaining walls, different types of bends	
31		1	5.2 Breast Walls, Retaining walls, different types of bends	
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32		1	Road Drainage: 6.1 Necessity of road drainage work, cross drainage works	

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33	W9	1	6.2 Surface and sub-surface drains and storm water drains. Location, spacing and typical details of side drains, side ditches for surface drainage, intercepting drains, pipe drains in hill roads, details of drains in cutting embankment, typical cross sections	
34		1	6.2 Surface and sub-surface drains and storm water drains. Location, spacing and typical details of side drains, side ditches for surface drainage, intercepting drains, pipe drains in hill roads, details of drains in cutting embankment, typical cross sections.	
35		1	7.1 Common types of road failures – their causes and remedies	
		1	7.2 Maintenance of bituminous road such as patch work and resurfacing	
36		1	7.3 Maintenance of concrete roads – filling cracks, repairing joints, maintenance of shoulders (berm), maintenance of traffic control devices	
37		W10	1	Construction equipments: Preliminary ideas of the following plant and equipment: 8.1 Hot mixing plant
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8.3 Tipper tractors (wheel and  
 track) scrapers bulldozers dumpers  
 shovels  
 graders roller dragline

		1	8.3 Asphalt mixer and lay boilers
		1	8.4 Road rollers
		1	8.4 Road pavers
		1	8.4 Road rollers
	W11	1	8.5 Modern construction equipments for roads
44		1	8.5 Modern construction equipments for roads
45		1	8.5 Modern construction equipments for roads
46	W12	1	8.5 Modern construction equipments for roads
47		1	REVISION
		1	REVISION
48		1	REVISION
49		1	REVISION
50		1	REVISION
51	W13	1	REVISION
		1	REVISION
52		1	REVISION
53		1	REVISION
54		1	REVISION
55	W14	1	REVISION
		:	PIQ
56		:	PIQ
57		:	PIQ
58		:	PIQ
59	W15	:	PIQ
		:	REVISION
		1	REVISION
<b>Total</b>		<b>75</b>	

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Faculty

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Signature of H.O.D.  
ANIL K. SINGH

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