



GOVT. POLYTECHNIC KORAPUT

ACADEMIC SESSION 2020-2021

SEMESTER- 4th

BRANCH - CIVIL ENGINEERING

SUBJECT – HIGHWAY ENGINEERING

FACULTY NAME – MADHUSMITA DEHURI

Period	Module/ Number	Topic to be covered
	UNIT-1	Introduction:
1		Importance of Highway transportation: importance organizations like Indian roads congress
2		Ministry of Surface Transport
3		Central Road Research Institute
4		Functions of Indian Roads Congress
5		IRC classification of roads
6		Organisation of state highway department
	UNIT-2	Road Geometrics:
7		Glossary of terms used in geometric and their importance
8		Right of way, formation width, Road margin, road shoulder
9		Carriage way, side slopes
10		Kerbs, formation level, Camber, Gradient
11		Types of camber & gradient ,Relationship between Camber and Gradient
12		Design and average running speed
13		Stopping sight distance
14		Passing sight distance
15		OMR Test
16		Necessity of curves Horizontal and Vertical curves, including transition curves
17		Concept of Super elevation,mathematical expression for super elevation
18		Methods of providing super elevation
	UNIT-3	Road Materials:
19		Difference types of road materials in use: soil, aggregates, and binders
20		Function of soil as highway Subgrade
21		California Bearing Ratio: methods of finding CBR valued in the laboratory at site and their significance
22		Testing of aggregates: Abrasion test
23		Impact test, Crushing strength test
24		Water absorption test & Soundness test
25		Discussion on units learned
26		OMR Test
	UNIT-4	Road Pavements:
27		Road Pavement: Definition of Flexible and Rigid pavement, Merits and demerits of different pavements and typical cross-sections
28		Functions of various components of Flexible pavements
29		Sub-grade preparation: Setting out alignment of road
30		Setting out of bench marks, borrow pits
31		Control pegs for embankment and cutting
32		Making profile of embankment
33		Construction of embankment
34		Compaction, methods of compaction, necessity of compaction
35		stabilization,methods of stabilization, necessity of stabilization
36		Preparation of subgrade as per recommendations of IRC Equipment used for subgrade preparation, Methods of checking camber

37		Discussion for internal exam
38		Internal Exam
39		Gradient and alignment
40		Sub base Course: Necessity of sub base, stabilized sub base
41		Purpose of stabilization (no designs)
42		Types of stabilization: Mechanical stabilization , Lime stabilization
43		Cement stabilization, Fly ash stabilization
44		Discussion on internal exam questions & distribution of evaluated answer sheet
45		Base Course: Preparation of base course, Brick soling, Stone soling and metalling
46		Water Bound Macadam and Wet-mix Macadam , Bituminous constructions and Different types
47		OMR Test
48		Surfacing: Surface dressing(i) Premix carpet and (ii) Semi dense carpet
49		Bituminous concrete , Grouting
50		Rigid Pavements: Concept of concrete roads as per IRC specification
	UNIT-5	Hill Roads:
51		Introduction: Typical cross-sections showing details of a typical hill road in cut
52		Typical cross-sections showing details of a typical hill road partly in cutting and partly in filling
53		Breast Walls & its importance
54		Retaining walls, different types of bends
	UNIT-6	Road Drainage:
55		Necessity of road drainage work
56		Types of Cross drainage works
57		Surface and Sub-surface drains
58		Storm water drains, Location
59		Spacing and typical details of side drains
60		Side ditches for surface drainage, intercepting drains, Pipe drains in hill roads
61		OMR Test
62		Details of drains in cutting embankment
63		Typical cross sections of road drainage
	UNIT-7	Road Maintenance :
64		Common types of road failures – their causes and remedies
65		Maintenance of bituminous road such as patch work and resurfacing
66		Maintenance of concrete roads – filling cracks, repairing joints
67		Maintenance of shoulders (berm), maintenance of traffic control devices
68		Basic concept of traffic study
69		Traffic safety and traffic control signal
	Unit-8	Construction equipments:
70		Preliminary ideas of plant and equipment : Hot mixing plant Tipper
71		Tractors (wheel and crawler), Scraper
72		Bulldozer, Dumpers, Shovels, Graders, Roller dragline, Road pavers
73		OMR Test
74		Asphalt mixer and Tar boilers , Modern construction equipments for roads
75		Revision