

GOVERNMENT POLYTECHNIC, BALANGIR
DEPARTMENT OF CIVIL ENGINEERING
LESSION PLAN
SESSION 2023-24

SUBJECT: HIGHWAY ENGG	BRANCH: CIVIL ENGINEERING
NAME OF THE FACULTY: ABINASH BISWAL	SEMESTER: 4 TH

SL NO.	CHAPTER	HOURS	LECTURE NO.	TOPIC TO BE COVERED
1	CHAPTER 01	05		INTRODUCTION
			1	importance of Highway transportation: importance organizations like Indian roads congress,
			2	Ministry of Surface Transport, Central Road Research Institute.
			3	Functions of Indian Roads Congress
			4	IRC classification of roads
			5	Organisation of state highway department
2	CHAPTER 02	20		ROAD GEOMETRICS
			1	Glossary of terms used in geometric and their importance
			2	Glossary of terms used in geometric and their importance
			3	Right of way, formation width,
			4	Road margin, road shoulder
			5	Carriage way, side slopes, kerbs, formation level
			6	Carriage way, side slopes, kerbs, formation level
			7	Camber and gradient
			8	Camber and gradient
			9	Design and average running speed
			10	Design and average running speed problems
			11	Stopping and passing sight distance
			12	Problems on stopping sight distance
			13	Problems on passing sight distance
			14	Necessity of curves

			15	Horizontal and vertical curves including transition curves
			16	Horizontal and vertical curves including transition curves
			17	Super elevation
			18	Problems on super elevation
			19	Methods of providing super – elevation
			20	Methods of providing super – elevation
3	CHAPTER 03	09		ROAD MATERIALS
			1	Difference types of road materials in use: soil, aggregates, and binders
			2	Difference types of road materials in use: soil, aggregates, and binders
			3	Function of soil as highway Subgrade
			4	California Bearing Ratio: methods of finding CBR valued in the laboratory and at site and their significance
			5	Testing aggregates: Abrasion test
			6	Impact test
			7	Crushing strength test
			8	Water absorption test
			9	Soundness test
4	CHAPTER 04	13		ROAD PAVEMENTS
			1	Road Pavement: Flexible and rigid pavement, their merits and demerits,
			2	Typical cross-sections, functions of various components
			3	Setting out alignment of road, setting out bench marks
			4	Control pegs for embankment and cutting, borrow pits, making profile of embankment
			5	Construction of embankment, compaction, stabilization, preparation of subgrade
			6	Methods of checking camber, gradient and alignment as per recommendations of IRC,
			7	Equipment used for subgrade preparation
			8	Necessity of sub base, stabilized sub base, purpose of stabilization
			9	Types of stabilization • Mechanical stabilization • Lime stabilization • Cement stabilization • Fly ash stabilization
			10	Preparation of base course, Brick soling, stone soling and metalling,

			11	Water Bound Macadam and wet-mix Macadam, Bituminous constructions
			12	Surfacing: • Surface dressing (i) Premix carpet and (ii) Semi dense carpet • Bituminous concrete • Grouting
			13	Concept of concrete roads as per IRC specifications
5	CHAPTER 05	07		HILL ROADS
			1	Introduction
			2	Typical cross-sections showing all details of a typical hill road in cut,
			3	Typical cross-sections showing all details of a typical hill road in cut,
			4	Partly in cutting and partly in filling
			5	Breast walls
			6	Retaining walls
			7	Different types of bends
6	CHAPTER 06	07		ROAD DRAINAGE
			1	Necessity of road drainage work, cross drainage works
			2	Surface and sub-surface drains and storm water drains.
			3	Location, spacing and typical details of side drains, side ditches for surface drainage,
			4	Intercepting drains, pipe drains in hill roads
			5	Details of drains in cutting embankment
			6	Details of drains in cutting embankment
			7	Typical cross sections of drainage
7	CHAPTER 07	07		ROAD MAINTENANCE
			1	Common types of road failures – their causes and remedies
			2	Common types of road failures – their causes and remedies
			3	Maintenance of bituminous road such as patch work and resurfacing
			4	Maintenance of concrete roads – filling cracks, repairing joints
			5	Maintenance of shoulders (berm)
			6	Maintenance of traffic control devices
			7	Basic concept of traffic study, Traffic safety and traffic control signal

8	CHAPTER 08	07		CONSTRUCTION EQUIPMENTS
			1	Preliminary ideas of the plant and equipment
			2	Hot mixing plant
			3	Tipper, tractors (wheel and crawler) scraper,
			4	Bulldozer, dumpers, shovels, graders, roller dragline
			5	Asphalt mixer and tar boilers
			6	Road pavers
			7	Modern construction equipments for roads