LESSON PLAN
DEPARTMENT OF CIVIL ENGINEERING
GANAPATI INSTITUTE OF ENGINEERING AND TCHNOLOGY, JAGATPUR, CUTTACK

SUBJECT: HIGHWAY ENGG. **Periods:** 5 per week **SEMESTER:** 4th

NAME OF FACULTY: JAYALAXMI BEHERA

From date: 13.02.2023 **To Date:** 23.05.2023 **No. of weeks:** 15

Week	Class Day	Theory / Practical Topics
1st	1st	Brief introduction on Highway Engg.
	2nd	Importance of Highway transportation: importance organizations like Indian roads congress, Ministry of Surface Transport, Central Road Research Institute
	3rd	Functions of Indian Roads Congress
	4th	IRC classification of roads
	5th	Organization of state highway department
2nd	1st	Road Geometrics : Glossary of terms used in geometric and their importance
	2nd	right of way, formation width,
	3rd	road margin, road shoulder, carriage way, side slopes, kerbs, formation level, camber and gradient
	4th	Design and average running speed,
	5th	Discussions
3rd	1st	stopping sight distance
	2nd	stopping sight distance
	3rd	passing sight distance
	4th	passing sight distance
	5th	Numerical
4th	1st	Necessity of curves, horizontal curves.
	2nd	Horizontal curves.
	3rd	vertical curves
	4th	vertical curves
	5th	Numerical
5th	1st	transition curves and super elevation,
	2nd	Setback distance
	3rd	Methods o f providing super – elevation
	4th	Design and calculation of super- elevation
	5th	Numerical
6th	1st	Road Materials: Difference types of road materials in use: soil, aggregates, and binders
	2nd	Function of soil as highway Subgrade
	3rd	Function of soil as highway Subgrade
	4th	California Bearing Ratio: methods of finding CBR valued in the laboratory and at site and their significance
	5th	Testing aggregates: Abrasion test,
7th	1st	impact test, crushing strength test
	2nd	water absorption test & soundness test
	3rd	Discussion
	4th	Discussion
	5th	Road Pavement: Road Pavement: Flexible and rigid pavement, their merits and demerits,
8th	1st	typical cross-sections, functions of various components Flexible pavements
	2nd	Sub-grade preparation:

		Setting out alignment of road, setting out bench marks, control pegs for embankment and cutting, borrow pits
	3rd	Sub-grade preparation: Setting out alignment of road, setting out bench marks, control pegs for embankment and cutting, borrow pits
	4th	making profile of embankment, construction of embankment, compaction, stabilization, preparation of subgrade
	5th	methods of checking camber, gradient and alignment as per recommendations of IRC, equipment used for subgrade preparation
9th	1st	Sub base Course: Necessity of sub base, stabilized sub base, purpose of stabilization (no designs) Types of stabilization (i) Mechanical stabilization (ii) Lime stabilization
	2nd	Cement stabilization, Fly ash stabilization
	3rd	Base Course: Preparation of base course, Brick soling, stone soling and metaling, Water Bound
	4th	Macadam and wet-mix Macadam, Bituminous constructions: Different types
	5th	Surfacing: Surface dressing: (i) Premix carpet and (ii) Semi dense carpet
10th	1st	Bituminous concrete, Grouting
	2nd	Rigid Pavements: Concept of concrete roads as per IRC specifications
	3rd	Introduction on Hill roads
	4th	Typical cross-sections showing all details of a typical hill road in cut, partly in cutting and partly in filling
	5th	Typical cross-sections showing all details of a typical hill road in cut, partly in cutting and partly in filling
11th	1st	Breast Walls, Retaining walls, different types of bends
	2nd	Discussion
	3rd	Discussion
	4th	Discussion
	5th	Road Drainage: Necessity of road drainage work, cross drainage works
12th	1st	Surface and sub-surface drains and storm water drains.
	2nd	Location, spacing and typical details of side drains,
	3rd	side ditches for surface drainage, intercepting drains,
	4th	pipe drains in hill roads, details of drains in cutting embankment, typical cross sections
	5th	Discussion
13th	1st	Discussion
	2nd	Road Maintenance: Common types of road failures – their causes and remedies
	3rd	Maintenance of bituminous road such as patch work and resurfacing
	4th	Maintenance of concrete roads – filling cracks, repairing joints
	5th	Maintenance of concrete roads – filling cracks, repairing joints
14th	1st	maintenance of shoulders (berm), maintenance of traffic control devices
	2nd	Basic concept of traffic study, Traffic safety and traffic control signal
	3rd	Discussion
	4th	Introduction on Construction equipment
	5th	Preliminary ideas of the following plant and equipment: Hot mixing plant
15th	1st	Tipper, tractors (wheel and crawler) scraper, bulldozer, dumpers, shovels, graders, roller dragline
	2nd	Tipper, tractors (wheel and crawler) scraper, bulldozer, dumpers, shovels, graders, roller dragline
	3rd	Asphalt mixer and tar boiler
	4th	Road pavers Modern construction equipment for roads.
	5th	Discussion