DEPARTMENT OF CIVIL ENGINEERING
GANAPATI INSTITUTE OF ENGINEERING AND TECHNOLOGY, JAGATPUR, CUTTACK

LESSON PLAN OF 4TH SEMESTER(2023-24) CIVIL ENGINEERING

DISCIPLINE-CIVIL ENGG.	SEMESTER-4th	NAME OF THE TEACHING FACULTY-PRIYABRATA TRIPATHY
SUBJECT-HIGHWAY ENGG. (Th.4)	NO OF DAYS/PER WEEK CLASS ALLOTTED: 3	SEMESTER FROM DATE-16/01/24 TO 26/04/24 NO. OF WEEKS-15
WEEK	**CLASS DAY**	**THEORY TOPICS**
1	1st	**Introduction** 1.1 Importance of Highway transportation: importance organizations like Indian roads congress
	2nd	Ministry of Surface Transport, Central Road Research Institute.
	3rd	1.2 Functions of Indian Roads Congress
2	1st	1.3 IRC classification of roads
	2nd	1.4 Organisation of state highway department
	3rd	**Road Geometrics** 2.1 Glossary of terms used in geometric and their importance, right of way, formation width,
3	1st	road margin, road shoulder, carriage way, side slopes, kerbs, formation level, camber and gradient
	2nd	2.2 Design and average running speed, stopping and passing sight distance
	3rd	2.3 Necessity of curves, horizontal and vertical curves including transition curves and super elevation, Methods o f providing super – elevation
4	1st	**Road Materials** 3.1 Difference types of road materials in use: soil, aggregates, and binders
	2nd	3.2 Function of soil as highway Subgrade
	3rd	3.3 California Bearing Ratio: methods of finding CBR valued in the laboratory and at site and their significance
5	1st	3.4 Testing aggregates: Abrasion test, impact test
	2nd	crushing strength test, water absorption test & soundness test
	3rd	**Road Pavements** 4.1 Road Pavement: Flexible and rigid pavement, their merits and demerits
6	1st	typical cross-sections, functions of various components
	2nd	Flexible pavements: 4.2 Sub-grade preparation: Setting out alignment of road, setting out bench marks, control pegs for embankment and cutting
	3rd	borrow pits, making profile of embankment, construction of embankment, compaction, stabilization, preparation of subgrade
7	1st	methods of checking camber, gradient and alignment as per recommendations of IRC, equipment used for subgrade preparation
	2nd	4.3 Sub base Course: Necessity of sub base, stabilized sub base, purpose of stabilization (no designs)
	3rd	Types of stabilization Mechanical stabilization Lime stabilization

8	1st	Cement stabilization Fly ash stabilization
	2nd	4.4 Base Course: Preparation of base course, Brick soling, stone soling and metalling, Water Bound Macadam and wet-mix Macadam,
	3rd	Bituminous constructions: Different types 4.5 Surfacing: Surface dressing
9	1st	(i) Premix carpet and (ii) Semi dense carpet Bituminous concrete Grouting
	2nd	4.6 Rigid Pavements: Concept of concrete roads as per IRC specifications
	3rd	**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 5.2 Breast Walls, Retaining walls, different types of bends
10	1st	**Road Drainage:** 6.1 Necessity of road drainage work, cross drainage works
	2nd	6.2 Surface and sub-surface drains and storm water drains
	3rd	Location, spacing and typical details of side drains, side ditches for surface drainage
11	1st	intercepting drains, pipe drains in hill roads, details of drains in cutting embankment, typical cross sections.
	2nd	**Road Maintenance** 7.1 Common types of road failures – their causes and remedies
	3rd	7.2 Maintenance of bituminous road such as patch work and resurfacing
12	1st	7.3 Maintenance of concrete roads – filling cracks, repairing joints, maintenance of shoulders (berm), maintenance of traffic control devices
	2nd	7.4 Basic concept of traffic study, Traffic safety and traffic control signal
	3rd	**Construction equipments:** Preliminary ideas of the following plant and equipment:
13	1st	8.1 Hot mixing plant
	2nd	8.2 Tipper, tractors (wheel and crawler)
	3rd	**scraper, bulldozer, dumpers, shovels.**
14	1st	graders, roller dragline
	2nd	8.3 Asphalt mixer and tar boilers
	3rd	8.4 Road pavers
15	1st	8.5 Modern construction equipments for roads.
	2nd	QUESTION AND ANSWER DISCUSSION
	3rd	QUESTION AND ANSWER DISCUSSION

13/01/24

Signature of Faculty

13.01.24

Signature of H.O.D