BHUBANANANDA ODISHA SCHOOL OF ENGINEERING, CUTTACK

DEPARTMENT OF CIVIL ENGINEERING



LESSON PLAN

|  |  |
| --- | --- |
| SUBJECT: HIGHWAY ENGINEERING (TH 4) | ACCADEMIC SESSION: 2021-22 |
| FACULTY: MRS RASHMIREKHA RAY | SEMESTER: 4TH  |
|  | SEC: A |

|  |
| --- |
| Sd/- |
| H O D (Civil Engg.) |

|  |  |  |
| --- | --- | --- |
| **Discipline:** **Civil Engineering**  | **Semester: 4th** | **Name of Teaching Faculty: RASHMI REKHA RAY**  |
| **Subject: Highway Engineering**  | **No. of Days / week class allotted: 05 period per week (Mon,Tues, Fri-1period each , Thu -- 2 Period )**  | **Semester From Date : 10-03-2022 To Date 10-06-2022** **No. of Weeks: 14**  |
| **Week**  | **Date**  | **No. of periods available**  | **Topics to be covered**  |
| 1ST  | 10/03/2022  | 2  | 1. **Introduction**

1.1 Importance of Highway transportation: importance organizations like Indian roads congress, Ministry of Surface Transport, Central Road Research Institute. |
| 11/03/2022  | 1  | 1.2 Functions of Indian Roads Congress 1.3 IRC classification of roads1.4 Organization of state highway department |
| 2ND  | 14/03/2022  | 1  | 1. **Road Geometric**

2.1 Glossary of terms used in geometric and their importance, right of way, formation width, road shoulder, carriage way, side slopes, kerbs, formation level,  |
| 15/03/2022  | 1  | road margin, camber and gradient  |
| 17/03/2022  | 2  | 2.2 Design and average running speed, stopping and passing sight distance  |
| 3RD  | 21/03/2022  | 1  | 2.2 Design and average running speed, stopping and passing sight distance  |
| 22/03/2022  | 1  | 2.2 Design and average running speed, stopping and passing sight distance  |
| 24/03/2022  | 2  | 2.2 Design and average running speed, stopping and passing sight distance  |

|  |  |  |  |
| --- | --- | --- | --- |
|  | 25/03/2022  | 1  | 2.3 Necessity of curves, horizontal and vertical curves including transition curves  |
| 4TH  | 28/03/2022  | 1  | 2.3 Necessity of curves, horizontal and vertical curves including transition curves  |
| 29/03/2022  | 1  | Monthly Class Test- 1  |
| 31/03/2022  | 2  | 2.3 Super elevation, Methods of providing super – elevation  |
| 5TH  | 04/04/2022  | 1  | 2.3 Super elevation, Methods of providing super – elevation  |
| 05/04/2022  | 1  | Problems on super elevation  |
| 07/04/2022  | 2  | 1. **Road Materials**
	1. Difference types of road materials in use: soil, aggregates, and binders
	2. Function of soil as highway Subgrade
 |
| 08/04/2022  | 1  | 3.3 California Bearing Ratio: methods of finding CBR valued in the laboratory and at site and their significance |
| 6TH  | 11/04/2022  | 1  | 3.4 Testing aggregates: Abrasion test, impact test  |
| 12/04/2022  | 1  | crushing strength test, water absorption test & soundness test  |
| 7TH  | 18/04/2022  | 1  | 1. **Road Pavements**

4.1 Road Pavement: Flexible and rigid pavement, their merits and demerits,  |
| 19/04/2022  | 1  | typical cross-sections, functions of various components flexible pavements 4.2 Sub-grade preparation: Setting out alignment of road, setting out bench marks  |
| 21/04/2022  | 2  | control pegs for embankment and cutting, borrow pits, 4.2 making profile of embankment, construction of embankment, compaction, stabilization, preparation of subgrade  |

|  |  |  |  |
| --- | --- | --- | --- |
|  | 22/04/2022  | 1  | 4.2 methods of checking camber, gradient and alignment as per recommendations of IRC, equipment used for subgrade preparation |
| 8TH  | 25/04/2022  | 1  | 4.3 Sub base Course: Necessity of sub base, stabilized sub base, purpose of stabilization (no designs)  |
| 26/04/2022  | 1  | Monthly Class Test-2  |
| 28/04/2022  | 2  | Types of stabilization:- Mechanical stabilization  Lime stabilizationp |
| 29/04/2022  | 1  |  Cement stabilization  Fly ash stabilization  |
| 9TH  | 02/05/2022  | 1  | 4.4 Base Course: Preparation of base course, Brick soling, stone soling and metaling, Water Bound Macadam and wet-mix Macadam  |
| 05/05/2022  | 2  | 4.4 Bituminous constructions: Different types Surfacing:  Surface dressing i. Premix carpet and ii. Semi dense carpet  |
| 06/05/2022  | 1  |  Bituminous concrete  Grouting  |
| 10TH  | 09/05/2022  | 1  | INTERNAL ASSESSMENT  |
| 10/05/2022  | 1  | INTERNAL ASSESSMENT  |
| 12/05/2022  | 2  | 4.6 Rigid Pavements: Concept of concrete roads as per IRC specification  |

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  | 1. **Hill Roads:**

5.1 Introduction: Typical cross-sections showing all details of a typical hill road in cut  |
| 13/05/2022  | 1  | 5.1 Details of a typical hill road in partly in cutting and partly in filling 5.2 Breast Walls, Retaining walls, different types of bend  |
| 11TH  | 17/05/2022  | 1  | 1. **Road Drainage:**

6.1 Necessity of road drainage work, cross drainage works  |
| 19/05/2022  | 2  | 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 |
| 20/05/2022  | 1  | 6.2, Pipe drains in hill roads, details of drains in cutting embankment, typical cross section |
| 12TH  | 23/05/2022  | 1  | Monthly Class Test- 3  |
| 24/05/2022  | 1  | 1. **Road Maintenance :**

7.1 Common types of road failures – their causes and remedies  |
| 26/05/2022  | 2  | 7.2 Maintenance of bituminous road such as patch work and resurfacing  |
| 27/05/2022  | 1  | 7.3 Maintenance of concrete roads – filling cracks, repairing joints, maintenance of shoulders (berm), maintenance of traffic control devices |
| 13TH  | 31/05/2022  | 1  | 7.4 Basic concept of traffic study  |
| 02/06/2022 | 2 | Traffic safety and traffic control signal **Construction equipments:**Preliminary ideas of the following plant and equipment:8.1 Hot mixing plant |
| 03/06/2022  | 1  | 8.2 Tipper, tractors (wheel and crawler) scraper, bulldozer dumpers, shovels, graders, roller dragline  |
| 14TH  | 06/06/2022  | 1  | 8.3 Asphalt mixer and tar boilers 8.4 Road pavers 8.5 Modern construction equipments for road  |
| 07/06/2022  | 1  | REVISION  |
| 09/06/2022  | 2  | Previous Year Questions and Answers Discussion  |
| 10//06/2022  | 1  | Previous Year Questions and Answers Discussion  |