BHUBANANANDA ODISHA SCHOOL OF ENGINEERING, CUTTACK

DEPARTMENT OF CIVIL ENGINEERING



LESSON PLAN

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| SUBJECT: HIGHWAY ENGINEERING (TH 4) | ACCADEMIC SESSION: 2021-22 |
| FACULTY: MRS RASHMIREKHA RAY | SEMESTER: 4TH |
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| H O D (Civil Engg.) |

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| **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 roads  1.4 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 |

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|  | 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 |

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|  | 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 |

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|  |  |  | 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 |