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: SRRI M S KAR | SEMESTER: 4TH  |
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| H O D (Civil Engg.) |

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| **Discipline:** **Civil Engineering** | **Semester:4th** | **Name of Teaching Faculty:****MAHAMRUTYUNJAYA SIVAPRASAD KAR** |
| **Subject:** **Highway Engineering**  | **No. of Days / week class allotted: 05 period per week ( Wed -2period,Thu, Fri&Sat -- 1 Period each )** | **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 | 1 | **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 Congress1.3 IRC classification of roads |
| 12/03/2022 | 1 | 1.4 Organization of state highway department |
| 2nd | 16/03/2022 | 2 | **2 Road Geometric**2.1 Glossary of terms used in geometric and their importance, right of way, formation width, road margin, road shoulder, carriage way, side slopes, kerbs, formation level, camber and gradient |
| 17/03/2022 | 1 | 2.2 Design and average running speed, stopping and passing sight distance |
| 3rd | 23/03/2022 | 2 | 2.2 Design and average running speed, stopping and passing sight distance |
| 24/03/2022 | 1 | 2.2 Design and average running speed, stopping and passing sight distance |
| 25/03/2022 | 1 | 2.2 Design and average running speed, stopping and passing sight distance |
| 26/03/2022 | 1 | 2.2 Design and average running speed, stopping and passing sight distance |
| 4th | 30/03/2022 | 2 | 2.3 Necessity of curves, horizontal and vertical curves including transition curves |
| 31/03/2022 | 1 | Monthly Class Test- 1 |
| 02/04/2022 | 1 | 2.3 Necessity of curves, horizontal and vertical curves including transition curves  |
| 5th | 06/04/2022 | 2 | 2.3 Super elevation, Methods of providing super – elevation |
| 07/04/2022 | 1 | 2.3 Super elevation, Methods of providing super – elevation |
| 08/04/2022 | 1 | **3 Road Materials**3.1 Difference types of road materials in use: soil, aggregates, and binders |
| 09/04/2022 | 1 | 3.2 Function of soil as highway Subgrade |
| 6th | 13/04/2022 | 2 | 3.3 California Bearing Ratio: methods of finding CBR valued in the laboratory and at site and their significance |
| 16/04/2022 | 1 | 3.4 Testing aggregates: Abrasion test, impact test, crushing strength test, water absorption test & soundness test |
| 7TH | 20/04/2022 | 2 | **4 Road Pavements**4.1 Road Pavement: Flexible and rigid pavement, their merits and demerits, typical cross-sections, functions of various components flexible pavements |
| 21/04/2022 | 1 | 4.2 Sub-grade preparation: Setting out alignment of road, setting out bench marks, control pegs for embankment and cutting, borrow pits,  |
| 22/04/2022 | 1 | 4.2 making profile of embankment, construction of embankment, compaction, stabilization, preparation of subgrade |
| 23/04/2022 | 1 | 4.2 methods of checking camber, gradient and alignment as per recommendations of IRC, equipment used for subgrade preparation |
| 8TH | 27/04/2022 | 2 | 4.3 Sub base Course: Necessity of sub base, stabilized sub base, purpose of stabilization (no designs) |
| 28/04/2022 | 1 | Types of stabilization:- Mechanical stabilization Lime stabilization |
| 29/04/2022 | 1 |  Cement stabilization Fly ash stabilization |
| 30/04/2022 | 1 | Monthly Class Test -2 |
| 9TH | 04/05/2022 | 2 | 4.4 Base Course: Preparation of base course, Brick soling, stone soling and metaling, Water Bound Macadam and wet-mix Macadam |
| 05/05/2022 | 1 | 4.4 Bituminous constructions: Different type |
| 06/05/2022 | 1 | Surfacing: Surface dressing1. Premix carpet and
2. Semi dense carpet

 Bituminous concrete Grouting |
| 07/05/2022 | 1 | 4.6 Rigid Pavements: Concept of concrete roads as per IRC specification |
| 10TH | 11/05/2022 | 2 | 4.6 Rigid Pavements: Concept of concrete roads as per IRC specification |
| 12/05/2022 | 1 | 4.6 Rigid Pavements:Concept of concrete roads as per IRC specification |
| 13/05/2022 | 1 | **5 Hill Roads:**5.1 Introduction: Typical cross-sections showing all details of a typical hill road in cut |
| 14/05/2022 | 1 | 5.1 Details of a typical hill road inpartly in cutting and partly in filling |
| 11TH | 18/05/2022 | 2 | 5.2 Breast Walls, Retaining walls, different types of bend |
| 19/05/2022 | 1 | **6 Road Drainage:**6.1 Necessity of road drainage work, cross drainage works |
| 20/05/2022 | 1 | 6.2 Surface and sub-surface drains and storm water drains.  |
| 21/05/2022 | 1 | 6.2 Location, spacing and typical details of side drains, side ditches for surface drainage, intercepting drains,  |
| 12TH | 25/05/2022 | 2 | 6.2 Pipe drains in hill roads, details of drains in cutting embankment, typical cross section |
| 26/05/2022 | 1 | Monthly Class Test- 3 |
| 27/05/2022 | 1 | **7 Road Maintenance :**7.1 Common types of road failures – their causes and remedies |
| 28/05/2022 | 1 | 7.2 Maintenance of bituminous road such as patch work and resurfacing |
| 13TH | 01/06/2022 | 2 | 7.3 Maintenance of concrete roads – filling cracks, repairing joints, maintenance of shoulders (berm), maintenance of traffic control devices |
| 02/06/2022 | 1 | 7.4 Basic concept of traffic study, Traffic safety and traffic control signal |
| 03/06/2022 | 1 | **8 Construction equipments:**Preliminary ideas of the following plant and equipment:8.1 Hot mixing plant |
| 04/06/2022 | 1 | 8.2 Tipper, tractors (wheel and crawler) scraper, bulldozer, dumpers, shovels, graders, roller dragline |
| 14TH | 08/06/2022 | 2 | 8.3 Asphalt mixer and tar boilers8.4 Road pavers8.5 Modern construction equipments for road |
| 09/06/2022 | 1 | REVISION  |
| 10/06/2022 | 1 | Previous Year Questions and Answers Discussion  |