

GOVERNMENT POLYTECHNIC JAIPUR

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DEPARTMENT OF CIVIL ENGINEERING

LESSON PLAN

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| Discipline: Civil Engg. | Semester: 4th | Name of the Teaching faculty : Rajashree Nayak |
| Subject: Highway Engg. Th-4 | No of Days/Week class allotted: 5 days | Semester from Date: 04.02.2025 to Date: 17.05.2025 No of weeks: 15 |
| Week | Class Day | Topics |
| 1st | 1st | Introduction Importance of Highway transportation: importance organizations like Indian roads congress |
| | 2nd | Ministry of Surface Transport , Central Road Research Institute. |
| | 3rd | Functions of Indian Roads Congress |
| | 4th | IRC classification of roads |
| | 5th | Organisation of state highway department |
| 2nd | 1st | Road Geometrics Glossary of terms used in geometric and their importance |
| | 2nd | Glossary of terms used in geometric and their importance |
| | 3rd | Right of way, formation width |
| | 4th | Road margin, road shoulder, carriage way, side slopes, kerbs, formation level |
| | 5th | Road margin, road shoulder, carriageway, side slopes, kerbs, formation level |
| 3rd | 1st | road margin, road shoulder, carriageway, side slopes, kerbs, formation level |
| | 2nd | Camber and gradient |
| | 3rd | Camber and gradient |
| | 4th | Design and average running speed, stopping and passing sight distance |
| | 5th | Design and average running speed, stopping and passing sight distance |
| 4th | 1st | Design and average running speed, stopping and passing sight distance |
| | 2nd | Design and average running speed, stopping and passing sight distance |
| | 3rd | Necessity of curves, horizontal and vertical curves including transition curves |
| | 4th | Necessity of curves, horizontal and vertical curves including Transition curves |
| | 5th | Necessity of curves, horizontal and vertical curves including Transition curves |
| 5th | 1st | Necessity of curves, horizontal and vertical curves including transition curves |

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| | 2nd | Necessity of curves, horizontal and vertical curves including transition curves |
| | 3rd | Necessity of curves, horizontal and vertical curves including transition curves |
| | 4th | superelevation, Methods of providing super-elevation |
| | 5th | superelevation, Methods of providing super-elevation |
| 6th | 1st | Road Materials Difference types of road materials in use: soil, aggregates, and binders |
| | 2nd | Difference types of road materials in use: soil, aggregates, and binders |
| | 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 | California Bearing Ratio: methods of finding CBR valued in the Laboratory and at site and their significance. |
| 7th | 1st | Testing aggregates: Abrasion test, impact test, crushing strength test, water absorption test & soundness test |
| | 2nd | Testing aggregates: Abrasion test, impact test, crushing strength test, water absorption test & soundness test |
| | 3rd | Testing aggregates: Abrasion test, impact test, crushing strength test, water absorption test & soundness test |
| | 4th | Testing aggregates: Abrasion test, impact test, crushing strength test, water absorption test & soundness test |
| | 5th | Road Pavements Road Pavement: Flexible and rigid pavement, their merits and demerits, typical cross-sections |
| 8th | 1st | 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, making profile of embankment |
| | 3rd | Sub-grade preparation: Setting out alignment of road, setting out bench marks, control pegs for embankment and cutting, borrow pits, making profile of embankment |
| | 4th | Construction of embankment, compaction, stabilization, preparation Of subgrade, methods of checking camber |
| | 5th | Gradient and alignment as per recommendations of IRC, equipment Used for subgrade preparation |
| 9th | 1st | Sub base Course: Necessity of subbase, stabilized subbase, purpose of stabilization (no designs) |
| | 2nd | Types of stabilization <input type="checkbox"/> Mechanical stabilization <input type="checkbox"/> Lime stabilization <input type="checkbox"/> Cement stabilization <input type="checkbox"/> Fly ash stabilization |
| | 3rd | Base Course: Preparation of base course, Bricksoling, stone soling and metalling |
| | 4th | Water Bound Macadam and wet-mix Macadam, Bituminous constructions: Different types |
| | 5th | Surfacing: Surface dressing |

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| | | (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 | Hill Roads: Introduction: Typical cross-sections showing all details of a typical hill road in cut, partly in cutting and partly in filling |
| | 4th | Introduction: Typical cross-sections showing all details of a typical hill road in cut, partly in cutting and partly in filling |
| | 5th | Introduction: Typical cross-section showing all details of a typical hill road in cut, partly in cutting and partly in filling |
| 11th | 1st | Introduction: Typical cross-sections showing all details of a typical hill road in cut, partly in cutting and partly in filling |
| | 2nd | Breast Walls, Retaining walls, different types of bends |
| | 3rd | Breast Walls, Retaining walls, different types of bends |
| | 4th | Breast Walls, Retaining walls, different types of bends |
| | 5th | Road Drainage: Necessity of road drainage work, cross drainage works |
| 12th | 1st | Surface and sub-surface drains and storm water drains |
| | 2nd | Surface and sub-surface drains and storm water drains |
| | 3rd | Location, spacing and typical details of side drains, side ditches for surface drainage |
| | 4th | Location, spacing and typical details of side drains, side ditches for surface drainage |
| | 5th | Intercepting drains, pipe drains in hill roads |
| 13th | 1st | Details of drains in cutting embankment, typical cross sections. |
| | 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 bituminous road such as patch work and resurfacing |
| | 5th | Maintenance of concrete roads—filling cracks, repairing joints, Maintenance of shoulders (berm), maintenance of traffic control devices |
| 14th | 1st | Maintenance of concrete roads—filling cracks, repairing joints, maintenance of shoulders (berm), maintenance of traffic control devices |
| | 2nd | Basic concept of traffic study, Traffic safety and traffic control signal |
| | 3rd | Basic concept of traffic study, Traffic safety and traffic control signal |
| | 4th | Construction equipments: Preliminary ideas of the following plant and equipment |
| | 5th | Hot mixing plant |
| 15th | 1st | Tipper, tractors (wheel and crawler) scraper, bulldozer, dumpers, shovels, graders, roller dragline |
| | 2nd | Asphalt mixer and tar boilers |
| | 3rd | Road pavers |
| | 4th | Modern construction equipments for roads |

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| | 5th | Modern construction equipments for roads |
| 16th | 1st | PREVIOUS YEAR QUESTIONS &ANS PRACTICE. |

LearningResources:

| SINo. | AuthorName | NameoftheBook |
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| 1 | S.K.Khanna&C.E.G. Justo | HighwayEngineering |
| 2 | S.P.Chandola | ATextBookOfTransportationEngineering |
| 3 | S.P.Bindra | Acourseon Highwayengineering |

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