**19CE41E2 - URBAN TRANSPORTATION PLANNING**

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| **Course Category** | Professional Elective | **Credits** | 3 |
| **Course Type** | Theory | **Lecture - Tutorial - Practical** | 3 - 0 - 0 |
| **Prerequisite** | Transportation Engineering | **Sessional Evaluation** | 40 |
| **Semester End Exam Evaluation** | 60 |
| **Total Marks** | 100 |

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| **Course Objectives** | 1. To outline planning process and stages in transport planning. 2. To demonstrate different types of transportation surveys. 3. To analyze trip generation concepts for transport planning. 4. To present trip distribution concepts. 5. To show methods of traffic assignment along with modal split. 6. To compare cost and benefits in transportation planning process. | |
| **Course Outcomes** | CO1 | Outline the basic concepts of transportation planning along with stages of transportation planning. |
| CO2 | Perform transportation surveys which are essential in urban transportation planning. |
| CO3 | Evaluate trip generation and attraction in an urban area. |
| CO4 | Conclude different methods of trip distribution. |
| CO5 | Predict mode choice of different trips along with route assignment. |
| CO6 | Summarize costs and benefits of transportation plans in order to make economic evaluation. |
| **Course**  **Content** | **UNIT – I**  **TRANSPORT PLANNING PROCESS:** Introduction, interdependence of the land use and traffic, systems approach to transport planning, Stages in transport planning – Survey and analysis of existing conditions, forecast analysis of future conditions and plan synthesis, evaluation, programme adoption and implementation, continuing study , difficulties in the transport planning process.  **UNIT – II**  **TRANSPORTATION SURVEY:** Introduction – study area, zoning, Inventory on existing travel pattern, types of Surveys – home interview surveys, commercial vehicles surveys, taxi surveys, roadside interview surveys, postcard questionnaire, registration number plate surveys, tags on vehicles, public transport surveys, inventory of transport facilities, inventory of land use and economic activities  **UNIT – III**  **TRIP GENERATION:** Trip based and activity based approach, trip attraction and trip production, trip purpose, trip classification, factors governing trip generation Trip generation analysis - multiple linear regression analysis and category analysis – problems.  **UNIT – IV**  **TRIP DISTRIBUTION:** Introduction, Methods of trip distribution – Growth factor methods - uniform (Constant) factor method – average factor method- problems, Synthetic methods – Gravity model- problems.  **UNIT – V**  **MODAL SPLIT**: Introduction – factors affecting modal split, modal split in the transport planning process, recent developments in modal split analysis.  **TRAFFIC ASSIGNMENT**: Purpose of traffic assignment, general principles, Assignment techniques – All-or-nothing assignment, Multiple route assignment and Capacity restraint assignment, diversion curves.  **UNIT – VI**  **ECONOMIC EVALUATION**: Need for Evaluation, Economic evaluation – costs and benefits of transport project, basic principles of economic evaluation, interest rates, cost benefit ratio analysis, Methods of economic evaluation – first year rate of return method, net present value method, internal rate of return method - problems . | |
| **Textbooks**  **and**  **References** | **TEXTBOOKS:**   1. Khanna, S.K. Justo C.E.G and Veeraraghavulu, “*Highway Engineering”,* Nem Chand &bros, 10th edition, 2018. 2. Dr. L.R.Kadiyali, “*Principles and Practice of Highway Engineering”*, Khanna publishers, 7th edition, 2019. 3. B.G. Hutchinson, “*Principles of Urban Transport Planning****”,*** Mc .grawhill publishers, 1st edition, 1974.   **REFERENCE BOOKS:**   1. Dr.L.R Kadiyali, “*Traffic engineering and Transport planning”*, Khanna publishers, 9th edition, 2017. 2. Papacostas.C.S, and Prevedouros, P.D, “*Transportation Engineering and Planning*”, Prentice - Hall of India Pvt Ltd, 3rd Edition, 2002. | |

**CO-PO Mapping:** 3-High Mapping, 2-Moderate Mapping, 1-Low Mapping, - -Not Mapping

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|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** |
| **CO1** | - | - | - | 1 | - | - | - | - | - | - | - | - |
| **CO2** | 2 | 2 | - | 1 | - | - | - | - | - | - | 2 | 2 |
| **CO3** | 2 | 3 | - | 1 | - | - | - | - | - | - | - | 1 |
| **CO4** | 2 | 3 | - | 1 | - | - | - | - | - | - | - | 1 |
| **CO5** | 2 | 2 | - | 1 | - | - | - | - | - | - | - | 1 |
| **CO6** | 2 | 2 | - | 1 | - | - | - | - | - | - | - | 1 |