



Sri AdichunchanagiriShikshana Trust (R)

**SJB Institute of Technology**

(Affiliated to Visvesvaraya Technological University, Belagavi & Approved by AICTE, New Delhi)

**Department of CIVIL ENGINEERING**

|   |  |                       |                            |
|---|--|-----------------------|----------------------------|
| <b>Course Title: Urban Transport Planning</b>                               |  |                       | <b>Course Code:18CV745</b> |
| <b>Semester: VII</b>  | <b>Academic Year:2021 – 22</b>           | <b>Total hrs.: 40</b> | <b>Hrs./Week: 03</b>       |
| <b>Int. Exam Hrs: 1hr 30min</b>   | <b>Internal Evaluation Max. Marks:40</b> |                       |                            |
| <b>Ext. Exam Hrs.: 03hr</b>   | <b>Ext. Exam Max. Marks: 60</b>          |                       |                            |
| <b>Lesson Plan Author / Design. / Dept.: Nisarga P, Assistant Professor</b> |  |                       |                            |

**Course Objectives:**

1. Understand and apply basic concepts and methods of urban transportation planning.
2. Apprise about the methods of designing, conducting and administering surveys to provide the data required for transportation planning.
3. Understand the process of developing an organized mathematical modelling approach to solve select urban transportation planning problem.
4. Excel in use of various types of models used for travel forecasting, prediction of future travel patterns

**Course Outcomes:**

CO1. Identify urban transport problems and conduct necessary surveys to provide the data required for transportation planning.

CO2. Develop travel demand models to determine future trip generation rate, trip distribution and model split for specific types of land use development.

CO3. Identify urban transport corridors and validate the developed model for long term transportation plan.

| CO  | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| C.1 | 3   |     |     |     |     |     |     |     |     |      |      | 1    |
| C.2 | 2   | 2   |     |     |     | 1   |     |     |     |      |      | 1    |
| C.3 | 2   | 2   |     |     |     | 1   |     |     |     |      |      | 1    |
| AVG | 2.3 | 2   |     |     |     | 1   |     |     |     |      |      | 1    |

## Syllabus

Course Title: URBAN TRANSPORT PLANNING

Course code: 18CV745

| <b>Module: I</b>  | <b>Teaching Hours</b> |
|---|-----------------------|
| <b>Urban transport planning:</b> Urbanization, urban class groups, transportation problems and identification, impacts of transportation, urban transport system planning process, modeling techniques in planning. Urban mass transportation systems: urban transit problems, travel demand, types of transit systems, public, private, para-transit transport, mass and rapid transit systems, BRTS and Metro rails, capacity, merits and comparison of systems, coordination, types of coordination. | 8                     |
| <b>Blooms Taxonomy:</b> L1 – Remembering, L2 – Understanding, L3 – Applying   |                       |

| <b>Module: II</b>  | <b>Teaching Hours</b> |
|--|-----------------------|
| <b>Data Collection and Inventories:</b> Collection of data – Organization of surveys and Analysis, Study Area, Zoning, Types and Sources of Data, Road Side Interviews, Home Interview Surveys, Commercial Vehicle Surveys, Sampling Techniques, Expansion Factors, Accuracy Checks, Use of Secondary Sources, Economic data – Income – Population – Employment – Vehicle Owner Ship | 8                     |
| <b>Blooms Taxonomy:</b> L1 – Remembering, L2 – Understanding, L3 – Applying  |                       |

| <b>Module: III</b>  | <b>Teaching Hours</b> |
|---|-----------------------|
| <b>Trip Generation &amp; Distribution:</b> UTPS Approach, Trip Generation Analysis: Zonal Models, Category Analysis, Household Models, Trip Attraction models, Commercial Trip Rates; Trip Distribution by Growth Factor Methods. Problems on above | 8                     |
| <b>Blooms Taxonomy:</b> L3 – Applying, L4 – Analysing   |                       |

| <b>Module: IV</b>   | <b>Teaching Hours</b> |
|---|-----------------------|
| <b>Trip Distribution:</b> Gravity Models, Opportunity Models, Time Function Iteration Models. Travel demand modeling: gravity model, opportunity models, Desire line diagram. Modal split analysis. Problems on above | 8                     |
| <b>Blooms Taxonomy:</b> L2 – Understanding, L3 – Applying, L4 – Analysing, L5:  |                       |

|   |                       |
|---|-----------------------|
| <b>Module: V</b>  | <b>Teaching Hours</b> |
| Traffic Assignment: Diversion Curves; Basic Elements of Transport Networks, Coding, Route Properties, Path Building Criteria, Skimming Tree, All-or-Nothing Assignment, Capacity Restraint Techniques, Reallocation of Assigned Volumes, Equilibrium Assignment. Introduction to land use planning models, land use and transportation interaction. | 8                     |
| <b>Blooms Taxonomy: L2 – Understanding, L3 – Applying, L4 – Analysing, L5:</b>  |                       |

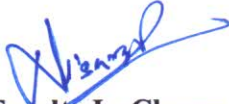
### Module Wise Plan

| MODULE | HOUR NO.                                  | Subject Topics  | CO  |
|--------|---|---|-----|
| 1      | <b>Urban transport planning</b>           |   |     |
|        | 1   | Urbanization: Urbanization & Urban Class Group                | CO1 |
|        | 2   | Transportation Problem, Identification & Impact               | CO1 |
|        | 3   | Transport Planning Urban: Transport System Planning           | CO1 |
|        | 4   | Modelling Techniques in Planning                              | CO1 |
|        | 5   | Mass Transport System: Urban Transit Problems & Travel Demand | CO1 |
|        | 6   | Rapid Transit System, BRTS                                    | CO1 |
|        | 7   | Metro Rails- Capacity, merits                                 | CO1 |
|        | 8   | Comparison of System & Co-ordination                          | CO1 |
| 2      | <b>Data Collection and Inventories</b>    |   |     |
|        | 9   | Data Collection: Study area, Zoning                           | CO1 |
|        | 10  | Types and source of data                                      | CO1 |
|        | 11  | Road side Interview Survey                                    | CO1 |
|        | 12  | Home Interview Survey, Commercial Vehicle Survey              | CO1 |
|        | 13  | Registration Plate Number, Tags on Vehicle Survey             | CO1 |
|        | 14  | Sampling Technique Expansion factor                           | CO1 |
|        | 15  | Use of Secondary data : Economic-Income-Population-           | CO1 |
| 16     | Employment-Vehicle owner ship             | CO1   |     |
| 3      | <b>Trip Generation &amp; Distribution</b> |   |     |
|        | 17  | Trip Generation: UTPS approach                                | CO2 |
|        | 18  | Trip generation Analysis: Factors affecting trip generation   | CO2 |

|   |                          |   |     |
|---|--------------------------|---|-----|
|   | 19                       | Zonal Models  | CO2 |
|   | 20                       | Category analysis   | CO2 |
|   | 21                       | Trip Distribution: Growth Factor Methods:<br>Uniform Growth Factor      | CO2 |
|   | 22                       | Average Growth Factor   | CO2 |
|   | 23                       | Fractor method  | CO2 |
|   | 24                       | Furness Method  | CO2 |
|   | <b>Trip Distribution</b> |   |     |
| 4 | 25                       | Trip Distribution: Synthetic models                                     | CO2 |
|   | 26                       | Gravity Model   | CO2 |
|   | 27                       | Opportunity Models  | CO2 |
|   | 28                       | Travel Demand Modelling: Time Function Iteration Models                 | CO2 |
|   | 29                       | Gravity Models  | CO2 |
|   | 30                       | Opportunity Models  | CO2 |
|   | 31                       | Desire line Diagram   | CO2 |
|   | 32                       | Modal Split Analysis  | CO3 |
|   | <b>Trip Assignment</b>   |   |     |
| 5 | 33                       | Trip Assignment: Diversion curves, Basic elements of transport networks | CO3 |
|   | 34                       | Coding & Route properties   | CO3 |
|   | 35                       | Path Building Criteria: Skimming tree                                   | CO3 |
|   | 36                       | All or nothing assignment   | CO3 |
|   | 37                       | Capacity Restraint Technique  | CO3 |
|   | 38                       | Equilibrium assignment  | CO3 |
|   | 39                       | Land Use Planning models: Introduction                                  | CO3 |
|   | 40                       | Land use and Transportation interaction                                 | CO3 |

**Text/ Reference Books:**

1. Kadiyali.L.R., 'Traffic Engineering and Transportation Planning', Khanna Publishers, New Delhi
2. Hutchinson, B.G, 'Introduction to Urban System Planning', McGraw Hill.
3. Khisty C.J., 'Transportation Engineering – An Introduction' Prentice Hall.
4. Papacostas, 'Fundamentals of Transportation Planning', Tata McGraw Hill.
5. Bruton M.J., 'Introduction to Transportation Planning', Hutchinson of London.

  
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