

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E. Semester: III

Civil (Transportation Engineering)

Subject name: **Mode Choice Modelling and Trip Assignment
Techniques(Major Elective - IV)**

A. Mode Choice Modelling Techniques:

Sr.No	Course content
1	Mode choice behaviour: Factors, Discrete Choice Model, Choice Set, Choice Probability, Identification of choices, Forecasting.
2	Methods of Data collection, preparation of format. RP and SP survey, analysis.
3	Binary, Logit Models, Generalised Extreme Value (GEV), NL, MNL, Probit, Mixed Logit and other types of models. Interpretation of results.
4	Estimation: Random Utility Theory, Probabilistic Choice Theory, Maximum Likely Hood, Aggregate and Disaggregate Demand Models, Statistics of Model Estimate, Methods of Estimate, Key Statistic test.
5	Concept of activity based analysis.

B. Trip Assignment Techniques:

Sr.No	Course content
1	Transportation Network: Nodes, links, characteristics, Link cost functions; Junction cost Functions, Shortest path algorithms.
2	Trip OD matrices, Route choice behaviour, Public transport trips and Private mode trips.
3	Methods for Static and Dynamic assignment, mathematical approaches, Simulation approach. Types of assignment procedure, Concepts of User equilibrium, System optimum and Stochastic user equilibrium condition.
4	Applications of trip assignment, network design problem, signal optimization, area traffic control, incident management, ITS applications.

Practical:

1. Preparation of format for RP and SP survey for small segment.
2. Data collection for RP and SP survey.
3. Analysis of collected data, preparation of mode choice model and its statistical check.
4. Problems based on different types of mode choice models.
5. Developing computer programme for shortest path algorithm.
6. Data collection for congested / problematic road network for trip assignment exercise.
7. Analysis of collected data for static and dynamic trip assignment. Develop computer programme or use suitable software. Compare results with existing network conditions.

Reference Books:

1. J. Ortuzar and L. G. Willumsen, *Modelling Transport*, John Wiley & Sons, Chincester, 1994
2. Mosche Ben Akiva and Steven R Lerman, *Discrete Choice Modeling-Theory and Application to Travel Demand*, M.I.T. Press Cambridge.
3. Kennech E.Train, *Discrete Choice Method With Simulation*.
4. Roy Thomas, *Traffic Assignment Techniques*, Avebury Technical, Aldershot, England.
5. Y. Sheffi, *Urban Transportation Networks: Equilibrium Analysis with Mathematical Programming Methods*, Prentice Hall, Englewood Cliffs, New Jersey, USA.
6. Bell M. G. H. and Iida Y, *Transportation Network Analysis*, John Wiley and Sons Ltd., New York, USA.