

Course Name:

Transportation Demand

Course Number:

20571

Credit:

3

Course Content (outline):

1. Introduction

- Concepts of Transportation Demand
- History of Transportation Demand
- Overview of Transportation Economics - Consumer Theory

2. Transportation Planning

- Transportation Planning Process and the Importance of Demand in the Process
- Urban Travel Patterns
- Applications of Models in Travel Demand Forecasting
- Traditional Travel Demand Forecasting Methods

3. Trip Generation: First Step

- Distribution, Models, and Variables
- Methods of Model Parameter Estimation
- Quantitative Demand Analysis
- Analysis of Aggregation, Disaggregation, and Access

4. Trip Distribution: Second Step

- Growth Factors: Uniform, Averaged, Fratar
- Gravity Model and Various Methods of Calibration
- Intervening Opportunities Model Versus Gravity Models
- Origin-Destination Trip Table
- Choice Theory in Travel Demand Forecasting
- Utility Theory
- Destination Choice Models

5. Travel Mode (Modal Split): Third Step

- Initial Models
- Econometric Models: Mode Choice
- Mode Choice Models

6. Traffic Assignment (Route Choice)

- Wardrop's Principles
- Probabilistic Traffic Assignment Methods
- Network Assignment Method
- Iterative Solution Methods
- Route Choice Models

7. How Do Four-Step Models Work

- Simultaneous and Sequential Models
- Model Responses to Policies
- Statistical Needs

8. Intercity Travel Demand

9. Air Transportation Demand

10. Freight Demand

11. Advanced Methods in Transportation Demand

References:

1. Hutchinson, B.G., Principles of Urban Transport Systems Planning, McGraw-Hill, New York, 1974.
2. Kanafani, A., Transportation Demand Analysis, McGraw-Hill, New York, 1983.
3. Morlok, E.K., Introduction to Transportation Engineering & Planning, McGraw-Hill, New York, 1978.
4. Ben-Akiva, M. & S.R. Lerman, Discrete Choice Analysis: Theory & Application to Travel Demand, The MIT Press, Cambridge, MA. 1991.
5. Ortuzar, J. D. & L.G. Willumsen, Modelling Transport, John Wiley & Sons, 1992.

6. Articles presented or distributed in the classroom.