Master of Technology

Transportation Engineering

Behavioral Travel Modelling

01TR0306

(PEC)

Objective of the Course:

- To introduce various travel behavior model.
- To introduce role of transport survey in planning.
- To introduce knowledge of various theoretical framework and statistical estimation and validation of sample data.

Credit Earned: 3

Students learning outcomes:

After successful completion of the course it is expected that student will be able to,

1. Understand various behavioral models
2. apply knowledge of travel surveys and their role in transport.
3. analyse theoretical framework and random utility theory in which the discrete choice models are cast.
4. evaluate the statistical estimation and validation of samples

Teaching and Examination Scheme

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial/ Practical Marks		Total Marks
Theory	Tutorial	Practical		ESE (E)	IA (M)	CSE (I)	Viva (V)	Term Work (TW)	
03	0	0	03	50	30	20	25	25	150

Detailed Syllabus

Sr No.	Title of the unit	Number of hours
1	**Survey design and analysis**	**05**
	Travel surveys and their role in transport planning, survey methods, precision and accuracy in travel surveys, sample design, sampling procedures, survey format, pilot surveys, survey administration, collection of stated and revealed preference data, survey data processing.	
2	**Discrete Choice Models**	**15**
	The multinomial logit model (MNL), Properties of MNL, The hierarchical logit model (HL), Correlation and model structure, The multinomial probit model, Choice by elimination and satisfaction, Habit and hysteresis. Specification and Estimation of Discrete Choice Models, Choice-set determination, Choice-set size, Choice-set formation, Specification and functional form, Statistical estimation, Validation samples, Modeling with stated-preference data	

3	**Advanced concepts**	**12**
	accommodating unobserved population heterogeneity in choice behavior, mixed logit models, joint stated preference and revealed preference modeling, and longitudinal choice analysis, Discrete choice models for integrated land use and transport modeling, review of state-of-the-art and future directions.	
4	**Model Aggregation and Transferability**	**10**
	Aggregate bias and forecasting, Aggregation Methods, Methods to evaluate model transferability, Updating with disaggregate data, Updating with Aggregate data.	
		42

Suggested Theory Distribution

The suggested theory distribution as per Bloom's taxonomy is as per follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery and evaluation					
Remember	Understand	Apply	Analyze	Evaluate	Create
5%	5%	20%	25%	25%	20%

Instructional Method and Pedagogy:

1. Use of Learning Management system like canvas
2. Demonstration through presentations on power point and videos and lectures
3. Brainstorming and group discussion sessions
4. Collaborative learning

Reference Book:

1. Ortuzar, J. D. and Willumsen, L.G., Modelling Transport, John Wiley & Sons, New York, 1996.
2. Domencich, T.A. and McFadden, D., Urban Travel Demand: A
3. Behavioral Analysis, North-Holland, 1975.
4. Ben-Akiva, M. and Lerman, S, Discrete Choice Analysis: Theory and Application to Travel Demand, MIT Press, 1985.
5. Oppenheim, N., Urban Travel Demand Modeling: From Individual Choices to General Equilibrium, John Wiley, 1995.
6. Borsch Supan Axel , Econometric analysis of discrete choice, Springer-Verlag, Berlin, 1987.
7. Richardson, Ampt, and Meyburg, Survey Methods for Transport Planning, Eucalyptus Press, 1995.