GUJARAT TECHNOLOGICAL UNIVERSITY
CIVIL (TRANSPORTATION ENGINEERING) (13)
BEHAVIORAL TRAVEL MODELING
SUBJECT CODE: 2721315
M.E. 2nd SEMESTER

Type of course : Major Elective - III

Prerequisite : Nil

Rationale :

The course is important to study for planning of the traffic system management. The commuter behavior also affects on the efficiency of the transportation management system. The courses discuss stated and revealed preference survey data and its use in travel modeling. The calibration and validation of the models are also covered in the study. The problems of model specification and estimation are covered for practical analysis. It also includes planning and evaluating the transport improvement projects, which requires models to forecast and examine their sensitivity with respect to change in the key variables.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks						Total Marks
L	T	P	C	Theory Marks		Practical Marks				
				ESE (E)	PA (M)	ESE (V)		PA (I)		
						ESE	OEP	PA	RP	
3	2#	0	4	70	30	30	0	10	10	150

Content:

Sr.No.	Topics	Teaching Hrs.	Module Weightage
1	Survey design and analysis: 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.	8	10%
2	Discrete Choice Models: 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	15	35%
3	Advanced concepts: 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.	12	35%
4	Model Aggregation and Transferability: Aggregate bias and forecasting, Aggregation Methods, Methods to evaluate model	10	20%

	transferability, Updating with disaggregate data, Updating with aggregate data.		

References:

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.

Course Outcomes:

1. To make the students aware about the various behavioral models.
2. To make the students aware about travel surveys and their role in transport planning
3. To explain the students about the theoretical framework and random utility theory in which the discrete choice models are cast.
4. To understand the statistical estimation and validation of samples.

Tutorial:

1. Problems based on Selected papers from journals such as Transportation Research, Transportation Science, and Transportation Research Record
2. Problems based on survey conducted by students on stated and revealed preference
3. Problems based on discrete choice models
4. Problems based on statistical validation of samples.

Review Presentation (RP): The concerned faculty member shall provide the list of peer reviewed Journals and Tier-I and Tier-II Conferences relating to the subject (or relating to the area of thesis for seminar) to the students in the beginning of the semester. The same list will be uploaded on GTU website during the first two weeks of the start of the semester. Every student or a group of students shall critically study 2 papers, integrate the details and make presentation in the last two weeks of the semester. The GTU marks entry portal will allow entry of marks only after uploading of the best 3 presentations. A unique id number will be generated only after uploading the presentations. Thereafter the entry of marks will be allowed. The best 3 presentations of each college will be uploaded on GTU website