Course Type	Course Code	Name of Course	L	T	P	Credit
DC	NCEC507	Transportation System, Design & Management	3	1	0	4

Course Objective

This course aims to provide a comprehensive scientific insight of transportation system planning in general, associated modelling techniques and relevant applications in specific. The course aims to provide students with an in-depth theoretical understanding of transportation planning. It also incorporates the concepts of transportation system management and accessibility and mobility considerations in transportation planning. Furthermore, the course discusses the sustainability aspects of transport system design for green mobility.

Learning Outcomes

Upon successful completion of this course, the students should be able to:

- Develop an understanding of transportation planning to measure transportation demand.
- Design various travel behavior surveys to collect transportation planning related data and analyze the data for calibration and validation of various types of models involved in traditional four-step travel demand forecasting process.
- Develop in-depth knowledge on the classic four stage demand models including: 1) trip generation, 2) trip distribution, 3) mode choice, and 4) trip assignment.
- Able to understand econometric models and use statistical packages
- Learn the concepts of sustainable transportation planning and land-use transport

Unit No.	Topics to be Covered	Credit Hours[L+T]	Learning Outcome
1	**Introduction:** Basic concepts in transportation planning, accessibility and mobility, characteristics of travel and transport problems, System components of transportation	6L	Understanding the basic concepts of transportation system planning
2	**Travel survey and analysis:** Type of data collection methods, Transportation survey and data collection: planning, design and implementation, Econometric methods for transportation data analysis (Regression Analysis), travel analysis zone (TAZ) development	10L+ 5T	Understanding on travel surveys and application of data analysis
3	**Travel demand modelling:** Travel demand and supply analysis, Transport Land use Interaction, Existing land use models, Comprehensive Mobility Plan (CMP), Microsimulation and Population Synthesis (IPF), Four-stage travel demand model and travel behaviour analysis (modelling the generation, spatial and temporal distribution, modal split, and route choice of travel), Activity Based Travel Demand Modelling, Introduction to Urban Freight and logistics	15L + 9T	Understanding on travel behaviour and application of econometric models for travel demand modelling and activity-based models (ABM) using statistical package
4	**Demand management:** Transportation demand management (TDM), transportation system management (TSM), smart city transportation planning: transit-oriented	6L	Understanding on travel demand management concepts and multimodal

	development (TOD), pedestrian-oriented development, liveable street planning, multimodal transportation planning, shared mobility concepts, integrated transportation management and planning,		framework for integrated transportation planning
5	**Sustainability:** Sustainable Transport Planning: transportation and energy, climate change, fuel choice and green mobility.	5L	Understanding on sustainable transport planning for green mobility
	Total	42 L + 14 T	

Text Books

1. Sarkar, P.K., Maitri, V., and Joshi, G.J. Transportation Planning, Principles, Practices and Policies, PHI Pvt. Ltd., 2016
2. Papacosta, C.S., and Prevedouros Transportation Engineering and Planning, PHI Pvt. Ltd.,2004

Reference Books

1. De Dios Ortuzar, J., and Willumsen, L. G. Modelling transport. John Wiley & Sons., 2011
2. Hutchinson B.G; Principles of Urban Transport Systems Planning; McGraw-Hill Book Company, 1974.
3. Chakroborty, P. and Das, A. Principles of Transportation Engineering, PHI Pvt. Ltd., 2012
4. Train, K. E. Discrete choice methods with simulation. Cambridge university press, 2009
5. Kadiyali, L. R. Traffic Engineering and Transport Planning, Khanna Publishers, 2015