01TR1101: Urban Transportation System Planning

Objective of the Course: Objectives of introducing this subject at first year level in Masters of civil engineering are: The subject covers the study of transportation system provided to urban areas.

- To impart knowledge of urbanization process, urban transportation system planning, land use planning, travel demand modeling procedure, different urban mass transportation systems and urban goods movement.

Credit Earned: 4

Students learning outcomes:

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

- To understand the urban transportation planning parameters.
- To impart knowledge to the civil engineering students on transportation system in urban areas.
- To make students understand about concepts of analysis of various steps included for transportation planning.
- To make students able to perform various origin and destinations survey and analyses the data in very sound manner.

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)	
3	0	2	4	50	30	20	25	25	150

Detailed Syllabus

Sr. No.	Title of the unit	Number of hours
1	**Introduction of urban mass transportation systems**	
	Urbanization, urban class groups, transportation problems and identification, impacts of transportation, urban transport system planning process, modeling techniques in planning, urban transit problems, Travel demand, types of transit systems, public, private, para-transit transport, mass and rapid transit systems, BRTS and	10

	Metro rails, capacity, merits and comparison of systems, Coordination, types of coordination	
2	**Introduction to land use planning models**	
	Land use and transportation interaction. The transportation study area definition; division into traffic zones; network identification and coding; types of trips, Types of O-D survey, characteristics of various surveys; sampling and expansion factors; accuracy checks, screen line checks, consistency checks	9
3	**Travel demand modeling**	
	Trip generation-zonal regression and category analysis, Trip distribution-growth factor models, gravity model, opportunity models, Desire line diagram, Modal split analysis-trip end models, trip interchange models, logit models, Trip assignment techniques-route choice, diversion curves, shortest path algorithms, all- or-nothing assignment, capacity restraint models	15
4	**Mass transit systems**	
	Introduction to routing and scheduling, transit system's performance parameters. Corridor identification and corridor screen line analysis, Urban forms and structures: point, linear, radial, poly-nuclear developments and suitable transit systems, Urban goods movement. Preparation of comprehensive plan and transportation system management planning	8

Suggested lists of Tutorials

1. Students can conduct home interview survey in group for the different zone/ward areas of city. From the collected data, they can develop zonal regression models, carry out category analysis, prepare base year O- D matrix and desire line diagram, mode wise and purpose wise trip distribution, trip length frequency distribution and prepare power point presentation of all this analysis.
2. Students can evaluate the existing mass transportation system. They can conduct the survey of boarding and alighting of passengers, find the actual demand on the routes and ascertain the optimum routing and scheduling.
3. Field Visit to Urban Mass Transportation System Service - Depot, Terminals, Offices.

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
10%	15%	20%	20%	20%	15%

Instructional Method and Pedagogy:

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

Recommended Study Material:

Reference Book:

1. B.G.Hutchinson, Principles of urban transportation system planning- McGraw-Hill, New York, 1974
2. Edward K.Morlok, Transportation Engg. and Planning
3. W.Dickey, Metropolitan Transportation Planning Tata McGraw-Hill, New Delhi, 1975
4. Blunder and Black, Land useTtransportation System
5. J.Ortuzer and L.G. Willumsen, Modelling Transport, Johan Wiley and Sons Chincester,1994
6. Vukan R. Vuchic, Urban Transit : Operations, Planning and Economics, Wiley Sons Publishers.
7. Peter White, Public Transport, UCL Press
8. Kadiyali L.R., Traffic Engineering and Transport Planning, Khanna Publishers
9. Khisty, C J., Transportation Engineering – An Introduction, Prentice-Hall, NJ
10. S.C. Saxena, Traffic Planning and Design, Dhanpat Rai Pub., New Delhi.
11. Partho Chakraborty and Animesh Das, Principles of Transportation Engineering, PHI
12. C. S. Papacostas, Fundamentals of Transportation System Analysis, PHI.
13. James H. Banks, Introduction to Transportation Engineering, WCB-McGraw Hill, New York