



GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Civil and Infrastructure Engineering

Subject Code: 3164017

Semester – VI

Subject Name: Urban Transport System Planning

Type of course: Professional Elective Course

Prerequisite: Highway and Traffic Engineering

Rationale:

Efficient urban mass transportation system is the prime need of today's life. Well planned road/railway network and reliable mass transportation systems are necessary to cater the increased need of the passengers and goods trips within urban as well as suburban area. Safe, economic, timely and comfortable urban mass transportation systems can reduce private vehicle trips, which ultimately reduce traffic congestion, accidents and environmental pollution. Study of this subject imparts knowledge of urbanization process, urban transportation system planning, land use planning, travel demand modeling procedure, different urban mass transportation systems and urban goods movement.

Teaching and Examination Scheme:

Teaching Scheme			Credits C	Examination Marks				Total Marks
L	T	P		Theory Marks		Practical Marks		
				ESE (E)	PA (M)	ESE (V)	PA (I)	
3	0	2	4	70	30	30	20	150

Content:

Sr. No.	Content	Total Hrs
1	Introduction: Urbanization, problems in transportation, urban transportation system planning process.	4
2	Urban Mass Transportation Systems: Types, public, private and para-transit systems, their capacities and suitability, need of coordination	6
3	Travel Demand Modelling: Land use planning, traffic analysis zones, types of trips, Trip generation analysis: Home interview and road side interview survey, regression and category analysis. Trip distribution analysis: O-D matrix, Growth factor methods, Gravity model, opportunity model Modal split analysis: Trip-end type and trip-interchange type models, RP and SP survey, Probit and Logit models Trip assignment analysis: route choice behavior, diversion curves, shortest path algorithms, All-Or-Nothing assignment, capacity restraint models, static and dynamic	18



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	models	
4	Introduction to routing and scheduling: Problems in routing and scheduling of urban mass transit systems, transit system's performance parameters. Procedure in urban mass transit infrastructure planning, construction and maintenance, impact analysis and economic evaluation.	10
5	Urban goods movement, TSM (Transportation System Management) techniques, ITS applications.	4

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
10	15	20	30	15	10

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Reference Books:

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

Course Outcomes: After learning this course the students will be able to

Sr. No.	CO statement	Marks % weightage
CO-1	Understand urbanization, its problems and different urban mass transportation systems	20
CO-2	Carry out travel demand modelling analysis	40

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CO-3	Analyse routing-scheduling of urban mass transportation systems, suggest suitable transportation system management techniques and understand urban goods movement	30
CO-4	Know about the procedure involved in urban mass transit infrastructure planning, construction and maintenance	10

List of Practical:

- Conducting Home Interview Survey of selected area
- Computer analysis of collected House Hold Data
 - Trip generation analysis: Linear Regression and Cross Category analysis.
 - Trip distribution analysis: Growth Factor Methods, Gravity Model.
 - Desire line diagram preparation
 - Modal split analysis.
 - Trip assignment: Shortest path analysis and network-assignment.
- Conducting RP/SP Survey
 - Computer analysis of collected data for mode choice analysis
- Conducting Boarding-Alighting survey of passengers on selected route of Mass Transit System
 - Computer analysis of collected data
- Investigating Routing and Scheduling of existing Mass Transit System
 - Computer application for solving the Routing and Scheduling problems.
- Conducting survey for Urban Goods movement
 - Computer analysis of collected data

Major Equipment: Nil

Field work: Collection of Home – Interview data. Presentation with group discussion on its analysis and interpretations.

Field Visit: Visit to Urban Mass Transportation System Service - Depot, Terminals, Offices, Construction site.

List of Open Source Software/learning website:

<http://nptel.ac.in/courses/105107067/30>