GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Master of Engineering

Level: PG

Branch: Civil Engineering

Subject Code: ME02065051

Subject Name: Urban Transportation Planning

w. e. f. Academic Year:	2024-2025
Semester:	2
Category of the Course:	Professional Elective Course

Prerequisit:	Basic Knowledge of Transportation Engineering
Rationale :	There are opportunities for education and employment with social, economic and cultural development in the urban area. The population attracted to the urban area due to development of Industries, medical facilities, tourism, business etc. Also, urban boundaries are expanding due to urbanization resulting increase in population. Study of this subject imparts knowledge of urbanization process, urban transportation system planning, land use planning, and travel demand modeling procedure, different urban mass transportation systems and urban goods movement.

Course Outcome:

After Completion of the Course, Student will able to:

No	Course Outcomes	RBT Level
CO-1	Carryout a detailed transportation planning for an urban area.	U, R,C
CO-2	Generate travel and land use patterns between given set of traffic analysis zones and transport network.	A, E
CO-3	Collect and analyses the data by conducting various transportation surveys for travel demand forecasting for horizon year by four stage modeling.	N, C
CO-4	Development of four stage transportation models for urban transportation planning for the study area.	N
CO-5	Classify and Suggest appropriate types of mass transportation system in urban area with performance measurement.	U, A

**Revised Bloom's Taxonomy (RBT)*

Teaching and Examination Scheme:

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Teaching Scheme (in Hours)			Total Credits L+T+ (PR/2)	Assessment Pattern and Marks				Total Marks
				Theory		Tutorial / Practical		
L	T	PR	C	ESE (E)	PA / CA (M)	PA/CA (I)	ESE (V)	
3	0	2	4	70	30	20	30	150

Course Content:

Unit No.	Content	No. of Hours	% of Weightage
1	URBANISATION & URBAN TRANSPORT PLANNING PROCESS: Scope and functions of transportation, traffic problem, functions of traffic engineering, Transport planning and its scope, components of comprehensive planning, urban transport system planning, land use forecast, travel forecast, systems approach to transportation planning, levels of urban transport planning. Urbanization cycle, Urban forms and structures, NUTP - Urban transportation problems, Sustainable Development Goals & Transport, System's Approach, Conventional and Sustainable Urban Transport Planning process.	8	20
2	LANDUSE AND TRANSPORTATION SURVEYS Land use transport planning, land use and transportation interaction, land use planning models, Lawry model, Grain-Lawry model, Study Area Delineation, zoning, types of surveys and data collection for urban land use and transportation planning models, sampling, survey data checks.	6	15
3	TRAVEL DEMAND MODELING TRIP GENERATION ANALYSIS Trip Productions & Attractions, Influencing factors, methods of trip generation, expansion factor methods, regression analysis method, category analysis- Simple & Multiple linear regression models.	6	15

4	TRIP DISTRIBUTION ANALYSIS Trip distribution matrix, methods of trip distribution, Growth factor methods, Detroit method, frater method, Furness method, Synthetic methods: Gravity, Opportunity Models, Calibration of Gravity model.	8	15
5	MODAL SPLIT ANALYSIS Choice of travel mode, basic approaches for modal split analysis, Influential factors, trip end models, trip interchange models, two stage modal split models, logit models for mode choice, Diversion curves & surfaces-Discrete choice models.	8	15
6	ROUTE ASSIGNMENT ANALYSIS Choice of routes, factors affecting route choice, methods of route assignment, Trip Assignment procedure, Diversion curves, All or Nothing assignment, Multipath assignment-Capacity restraint assignment, User equilibrium and system equilibrium approach-Stochastic assignment approach. URBAN MASS TRANSORTATION SYSTEMS Urban transit problems, travel demand, types of transit system, public, private, para-transit transport, mass and rapid transit systems, BRTS, metro rails, capacity, comparison of systems, coordination, types of coordination.	9	20
	TOTAL	**45**	**100**

Suggested Specification Table with Marks (Theory):

Distribution of Theory Marks (in %)					
R Level	**U Level**	**A Level**	**N Level**	**E Level**	**C Level**
20	**20**	**20**	**15**	**20**	**5**

Where R: Remember; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create (as per Revised Bloom's Taxonomy)

References/Suggested Learning Resources:

(a) Books:

1. Bowmen, J. and M.benAkiva, Activity based travel Forecasting; in Activity based travel forecasting. Washington, DC:U.S. Department of Transportation, Report DOT-97-17.

2. Chakroborty P., Das N., Principles of Transportation Engineering (2nd edition), PHI, New Delhi,2017

3. Dickey J. W., Metropolitan Transportation Planning, TataMc-Graw Hill
4. Khisty C J., LallB.Kent,Transportation Engineering–An Introduction,Pearson Education
5. Ortuzar, J. D., Willumsen, L. G., Modeling Transport, John Wiley & Sons
6. Papacostas C. S.andPrevedouros, P. D.,Transportation Engineering & Planning, PHI, New Delhi
7. P.K. Sarkar, Vinay Maity, G.J.Joshi., Transportation Planning: Principles, Practices and Policies PHI, New Delhi,
8. B.G.Hutchinson, Principles of urban transportation system planning- McGraw- Hill, New York,
9. Edward K.Morlok, Transportation Engg. and Planning
10. Blunder and Black, Land useTtransportation System J.Ortuzer and L.G. Willumsen, Modelling Transport, Johan Wiley and Sons Chincester,1994
11. Vukan R. Vuchic, Urban Transit : Operations, Planning and Economics, Wiley Sons Publishers.
12. Peter White, Public Transport, UCL Press
13. Kadiyali L.R., Traffic Engineering and Transport Planning, Khanna Publishers
14. S.C. Saxena, Traffic Planning and Design, Dhanpat Rai Pub., New Delhi.
15. James H. Banks, Introduction to Transportation Engineering, WCB-McGraw Hill, New York

(b) Open source software and website:
https://nptel.ac.in/courses/105105204

https://nptel.ac.in/courses/105105208

Suggested Course Practical List: If any

Tutorial will cover the following:
1. Study of comprehensive mobility plan of city and transportation process'
2. Study of various land use transportation models and surveys.
3. Trip generation analysis.
4. Trip distribution analysis
5. Modal split analysis
6. Route assignment analysis
7. Study of various mass transportation systems.

List of Laboratory/Learning Resources Required:

Speed Radar Gun

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