GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering
Subject Code: 3160608
Semester VI
Subject Name: Urban Transportation Planning

Type of course: Professional Elective courses-II

Prerequisite: Nil

Rationale:
In Urban area there are opportunities for education and employment with social, economic and cultural development. Industries, medical facilities, tourism, business models attract population from surrounding. Increase in population expanding boundaries of urban areas. Rapid urbanization leads to planning demand of households and land use activities. Vehicle ownership i.e. number of private vehicles increasing at faster pace which demands for traffic management. Sprawl in urban area necessitates efficient road/railway network and reliable mass transportation systems 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 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, and travel demand modeling procedure, different urban mass transportation systems and urban goods movement.

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)	
3	0	2	4	70	30	30	20	150

Content:

Sr. No.	Content	Total Hrs
1	Urbanization, urban class groups, transportation problems and identification, impacts of transportation on urban development, urban transport system planning process. Introduction to Preparation of comprehensive plan and transportation system management planning. Urban forms and structures: point, linear, radial, poly-nuclear	5
2	Urban mass transportation systems: urban transit problems, travel demand, types of transit systems, public, private, para-transit transport, mass and rapid transit systems, BRTS and Metro rails, capacity, merits and comparison of systems, coordination, types of coordination.	6
3	Survey and data collection for urban landuse and transportation planning models, Study area definition; division into traffic analysis zones; network identification and coding; types of trips, socio economic and trip characteristics of urban area; home interview survey/ Household Information Survey; roadside interview survey; goods transportation information survey, mass transit survey, Intermediate public transport/IPT surveys; methods of sampling and expansion factors; accuracy checks, screen line checks, consistency checks.	9

4	Travel demand modeling: Four stage modeling: Factors affecting trip generation, methods of trip generation -zonal regression and cross category /classification analysis, Trip distribution-growth factor methods, gravity model, Desire line diagram. Trip Assignment models, Factors affecting mode choice and route choice. Captive rider and choice rider.	15
5	Mass transit systems: Introduction to routing and scheduling, parameters to measure performance of transit system. Corridor identification and corridor screen line analysis. As per developments suitability of transit system.	6
6	Introduction to goods movement study for urban area. Problems and issues of urban goods movement. Factors affecting goods movement, components of urban goods traffic.	1

Course Outcomes: At the end of the course, Student will be able to

Sr. No.	CO statement	Marks % weightage
CO-1	Explain basics of urban, town, transportation planning and existing system.	20
CO-2	Collect the data and analyze for travel demand forecasting for horizon year by four stage modeling.	25
CO-3	Classified types and Suggest mass transportation system in urban area with performance measurement.	25
CO-4	Development of trip generation and trip distribution models for study area.	20
CO-5	Describe goods/freight movement in urban area and identify the factors affecting.	10

Suggested Specification table with Marks (Theory): (For BE only)

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
10%	20%	20%	25%	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. Kadiyali L.R., Traffic Engineering and Transport Planning, Khanna Publishers
2. Khisty, C J., Transportation Engineering – An Introduction, Prentice-Hall, NJ
3. S.C. Saxena, Traffic Planning and Design, Dhanpat Rai Pub., New Delhi.
4. Partho Chakraborty and Animesh Das, Principles of Transportation Engineering, PHI
5. C. S. Papacostas, Fundamentals of Transportation System Analysis, PHI.

6. Pradip Kumar Sarkar, Vinay Maitri, G.J.Joshi, Transportation Planning :Principles, Practices and Policies, PHI

List of Experiments: Assignments based on syllabus including numerical, survey and analysis and visit report.

Major Equipment: N.A.

List of Open Source Software:

- TransCAD/Cube/VISUM
- Q-GIS

Field Visit:

1. A visit to Public Transportation System and office of operator for urban area.
2. A visit to authority office-Town planning section, urban planning section, urban development section.
3. A visit to depot, terminal, bus stops.