

GUJARAT TECHNOLOGICAL UNIVERSITY

CIVIL (TOWN & COUNTRY PLANNING) (48) REGIONAL & MASS TRANSPORTATION SYSTEM PLANNING

SUBJECT CODE: 2724805

SEMESTER: II

Type of course: Major Elective - II

Prerequisite: Understanding on urban transportation planning, transportation models, worksheets;

Rationale: The course shall help to enhance the idea of transportation planning at the regional level; to understand the techniques of developing models for the regional transportation planning and to make the students conversant with Urban Mass Transit Planning and Freight Transportation Planning procedure.

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)			
					ESE	OEP	PA	RP		
3	2#	2	5	70	30	20	10	10	10	150

Content:

Sr. No.	Content	Total Hrs	% weightage
1	Demographic and employment forecasting models Demographic models - linear, exponential and logistic models; cohort survival models - birth, aging and migration models; employment forecasting models - economic base mechanism; input and output models - dynamic models of population and employment, multiregional extensions	10	19
2	Transport modelling and implementation Need & role of transport models, issues, transport models in practice, simplified transport demand models, traffic forecasting, urban planning and transportation planning integration, statutory provisions, IUT Guidelines, IRC recommendations, software applications, Transportation Master Plan	14	26
3	Regional transportation development - delineation of planning regions Concept of region and space – types of regions, rural road network development approach, regional freight transportation- issues & approach, demand assessment, various models, para-transit requirement and planning, best practices	16	30
4	Urban mass transit planning & modelling Transit classification, transit network design, classification of routes, prediction of transit usage, evaluation of network, scheduling principles & methodology, urban freight transportation: freight demand, spatial distribution of goods, truck terminal planning.	14	26

Reference Books:

1. Hutchinson, B. G., "Principles of Urban Transportation System Planning", Mc-Graw Hill 1974.
2. Oppenheim, N., "Applied Models in Urban and Regional Analysis", Prentice-Hall, NJ.
3. Khisty C. J., Lall B. Kent, "Transportation Engineering – An Introduction", Prentice Hall, NJ, 2005
4. Chand Mahesh, Puri U. K., "Regional transportation in India", Allied Publishers, New Delhi, 1983.
5. Glassion John, "Introduction to regional planning", Hutchinson and MIT Press, Cambridge, 1996.
6. Ortuzar J. D., Willumsen L. G., "Modeling Transport", John Wiley & Sons, 1994
7. Vukan R. Vuchic, "Urban Transit: Operations, Planning and Economics", Wiley Sons Publishers.
8. Geetam Tiwari (Editor); "Urban Transport for Growing Cities – High Capacity Bus Systems" Macmillan India Ltd, New Delhi (2002) (ISBN: 0333 93784 8)
9. H. M. Saxena; "Transport Geography"; Rawat Publications, Jaipur (2005) (ISBN: 81-7033-945-6)
10. Piyush Kansal, "Reading material on Advanced Transportation Planning", Institute of Town Planners, India, New Delhi (1998)
11. Code of practice (Part 1 to 5), Institute of Urban Transport, Ministry of Urban Development, Govt. of India, 2012

Course Outcome:

After learning the course the students should be able to:

Understanding on concepts and use of techniques for regional and mass transportation needs, assessment and planning, use of models and software.

List of Experiments (Practical):

1. Traffic survey (field exercise)
2. Trip generation modeling
3. Trip distribution & trip assignment modeling
4. Transportation master planning at regional scale
5. Software demonstration – transportation
6. Application of transportation planning software
7. Field visit to truck terminal/ logistic park
8. Field visit to mass transportation facility

Assignment work (Tutorial):

Students shall refer the books and reference materials and prepare answers to the assignment problems including the topics of syllabus as mention herewith.

1. Problems based on population and employment forecasting by different methods.
2. Problems based on cohort analysis.
3. Problems based on regional and rural road network development concept.
4. Problems based on urban mass transit routing and scheduling procedure.
5. Problems based on freight demand and goods transportation.
6. Planning and design of truck terminal.

Students independently to prepare a "Graduate Report" of Innovative Technique and Practice and submit the same with presentation.

Research Paper (RP):

Each students shall study at least two research papers from the listed journals on GTU portal. Each paper shall be studied – students shall prepare brief report on paper and present the findings. The same shall be presented among all students and submit to university.

Open ended problem (OEP)

1. What are the difficulties observed in establishing efficient mass transit facility in an urban area?

2. Which method is best suitable and applicable to identify different needs/ aspirations of passengers while planning for mass transit system?
3. What are the anticipated impacts of DFC on DMIC? Why such corridors are necessary?

Major Equipment:

Computers with higher configuration and internet, server.
DVR system with camera and hard drive for traffic studies

List of Open Source Software/learning website:

- CAD drafting tools
- Google earth tool
- MATSim (<http://www.matsim.org/downloads>)
- TRANSIMS (<http://sourceforge.net/projects/transims/>)
- Multimodal trip planning & analysis – OTP and OTP Analyst (<http://www.opentripplanner.org/>)
- OpenMBTA Real-Time Bus & Subway (<http://openmbta.org/>)
- Transportation Learning Center (<http://www.transportcenter.org/>)

Review Presentation (RP): The concerned faculty member shall provide the list of peer reviewed Journals and Tier-I and Tier-II Conferences relating to the subject (or relating to the area of thesis for seminar) to the students in the beginning of the semester. The same list will be uploaded on GTU website during the first two weeks of the start of the semester. Every student or a group of students shall critically study 2 papers, integrate the details and make presentation in the last two weeks of the semester. The GTU marks entry portal will allow entry of marks only after uploading of the best 3 presentations. A unique id number will be generated only after uploading the presentations. Thereafter the entry of marks will be allowed. The best 3 presentations of each college will be uploaded on GTU website