GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering
Subject Code: 3160615
Subject Name: TRAFFIC ENGINEERING AND MANAGEMENT
Semester VI

Type of course: Professional Elective Course-III

Rationale:

1. To set a compact foundation in the field of traffic engineering, its management in order to achieve the safety to the road users.
2. To enable the students to apply the basic principles of traffic engineering in the design of traffic facilities based on traffic flow theory.
3. To equip the students for traffic system management in the urban area.
4. To enable the students for estimating capacity and level of service for the rural and urban area.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
				Theory Marks		Practical Marks		
L	T	P	C	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:** Traffic engineering administration and functions, Organization of the traffic engineering department, Road user and vehicular characteristics.	2
2	**Basic traffic flow parameter and Traffic Surveys:** Definition – Flow, Volume, Speed, Space headway, Time headway, Density. Relationship between Flow, Speed and Density, **Traffic Surveys:** Speed, Journey time and Delay surveys, Classified volume count survey, Vehicle occupancy survey, Origin – Destination survey, Parking Survey, Use of photographic techniques in traffic survey.	8
3	**Lighthill and Witham's Theory:** General, Assumption, Theory, Approach to signalized intersection, Bottleneck, Car following theory, Queuing theory concept	5
4	**Traffic Forecasting:** Need for traffic forecasting, Types of traffic, Forecasts based on past trends and extrapolation, period for forecasting.	4
5	**Parking studies:** Traffic and parking problems, Ill effects of parking, Zoning and parking space requirement standards, Design standards for on street parking, Off street parking facilities, Peripheral parking system.	2

6	**Design of Intersection:** Design of at grade & grade separated intersection – rotary intersection – capacity of rotary intersection – Traffic signals, Advantages and disadvantages, Types of signals, Methods of setting signal timings, Warrants for signals, Coordinated control of signals, Necessity of signal coordination, Types of coordinated signal system.	**10**
7	**Traffic Accidents – Causes and prevention:** Accident situation in India, Collection of accident data, Statistical methods for analysis of accident data, Road and it's effect on accidents, Skidding, Speed in relation of safety, Traffic management measures and their influence on accident prevention, Condition and collision diagram and its utility, Legislation, Enforcement, Education and Propaganda.	**4**
8	**Traffic system management:** Introduction, Travel demand management, Traffic management measures, Restrictions to turning movements – one way streets – tidal flow operations-Traffic segregation –Traffic calming- Exclusive bus lanes, conflict point diagram for various types of streets, Introduction to ITS in traffic management.	**2**
9	**Highway Capacity:** Importance of 'Capacity' in Highway transportation studies, Capacity of uninterrupted flow conditions as per Indo-HCM, PCU in reference to Indo-HCM in urban and rural area, Determination of theoretical capacity, Level of service, Factors affecting capacity and level of service.	**5**

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

Sr. No.	CO statement	Marks % weightage
CO-1	Determine the traffic flow parameters for traffic management	20
CO-2	Predict the future traffic demand for the urban and rural area	20
CO-3	Plan the parking plots as per the traffic availability in the urban area	10
CO-4	Design the various types of intersection in the urban area.	20
CO-5	Propose the different types of traffic system management technique.	15
CO-6	Evaluate the capacity and level of service on the streets of rural and urban area.	15

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%**	**20%**	**10%**	**20%**

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. Dr. Kadiyali L. R., Traffic Engineering and Transport Planning, Khanna Publishers
2. Dr. Sharma S. K., Principles, Practice and Design of Highway Engineering (Including Airports), S. Chand & Company Ltd.
3. Chakraborty Partho, Das Animesh, Principles of Transportation Engineering, PHI
4. Khanna S.K., Justo C.E.G., Highway Engineering, Nem Chand & Bros., Roorkee.
5. Bindra S.P., A course in Highway Engineering, Dhanpat Rai Publications
6. Kadiyali L. R. and Lal, N. B., Principles & Practice of Highway Engineering, Khanna Publishers, Delhi.
7. Chakraborty Partha, Das Animesh, Principles of Transportation Engineeirng
8. Indo-Highway Capacity Manual, 2018
9. Martin Whol, Brian V Martin , Traffic system Analysis for Engineers and Planners, McGraw Hill, NY, 1967
10. IRC-SP -12 2015 Parking facilities in Urban Roads
11. IRC SP - 41 Guidelines for the Design of At-Grade Intersection
12. IRC 35 - 2015 Code of Practice for Road Markings – Second Revision
13. IRC 67 - 2001 Road Signs
14. IRC 108 - 2015 Guidelines for traffic forecast on Highways
15. IRC 119 - 2015 Guidelines for traffic safety Barriers
16. IRC 65 - 1976 Traffic Rotaries
17. IRC 93 - 1985 Design & Installation of Road Traffic Signals

List of Experiments:

1. Determination of various speeds to be used for geometric design, traffic regulation at the urban/rural road
2. Determination of signal timings at the intersection of the urban area

List of Traffic Survey:

1. Spot speed survey
2. Moving car method of survey for journey time
3. Delay studies survey
4. Classified volume count survey
5. Vehicle occupancy survey
6. Origin – Destination survey
7. Parking survey

List of Open Source learning website:

1. http://www.nptel.iitm.ac.in/courses/

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