

# GUJARAT TECHNOLOGICAL UNIVERSITY

## CIVIL (TRANSPORTATION ENGINEERING) (13)

TRAFFIC ENGINEERING  
**SUBJECT CODE:** 2711302  
 M.E. 1<sup>st</sup> SEMESTER

**Type of course:** Core Course

**Prerequisite:** Nil

**Rationale:** The objective of the study of Traffic Engineering is to provide safety to the road users and regulating traffic flow on the multi-lane urban roads. It is necessary to understand the traffic flow parameters for a Traffic Engineer. Traffic Engineer should understand the basic of design of signals, intersection, capacity and level of service to provide safe, efficient and economic transportation of goods and passengers. It is important to know the methods of traffic survey methods and Traffic management techniques. The subject is also important to know the various traffic control devices. Accidents in urban area increase rapidly. It is necessary to educate the students about the prevention of accidents. The traffic engineer should know about the Environmental impact of a traffic flow and its remedial measures. The study of simulation is also important to solve the traffic and accidents related problems

### Teaching and Examination Scheme:

Teaching Scheme			Credits C	Examination Marks						Total Marks
L	T	P		Theory Marks		Practical Marks				
			ESE (E)	PA (M)	PA (V)		PA (I)			
					ESE	OEP	PA	RP		
3	2#	2	5	70	30	20	10	10	10	150

### Content:

Sr. No.	Topics	Teaching Hrs.	Module Weightage
1	Introduction: Basic components of traffic and their characteristics, Fundamental variables of traffic and their interrelationship, headway - measurement techniques and analysis	5	10
2	Highway Capacity, Level of Service – Measurement Techniques, HCM Methods, Design hourly volumes and speed, its uses	5	15
3	Transportation surveys- O-D survey, methodology and analysis.	5	10
4	Merging – Diverging Flow, Weaving Flow, Length Calculations.	3	10
5	Traffic Control Devices, Rules, Signs, and Signals – Signal Cycle Time Calculations, Isolated and Co-Ordinated Signals	6	15
6	Traffic planning and design – for pedestrians, intersections	6	10
7	Traffic Management: TSM Techniques	3	5
8	Parking survey, characteristics and interpretation and design	3	5
9	Road accidents and safety measures	3	5
10	Environmental Impact of Traffic – Air, Noise Pollution	3	5
11	Simulation in traffic engineering design	3	10

**Reference Books:**

1. L.J.Pingnataro, Traffic Engineering; Theory and Practice. Prentice Hall, Englewood Cliffs, 1973.
2. M.Wohl and B.V.Martin, Traffic System Analysis for Engineering and Planners, McGraw-Hill. New York, 1983.
3. D.R.Drew, Traffic Flow Theory and Control, McGraw Hill. New York 1968.
4. W.R.McShane, R.P.Roess and E.S.Prassas, Traffic Engineering, Prentice Hall, New Jersey, 1990.
5. R.J.Salter, Highway Traffic Analysis and Design, McMillan, Hampshire, 1989.
6. Highway Capacity Manual, Transportation Research Board, Washington D.C., 1997, 2000
7. Partho Chakraborty and Animesh Das, Principles of Transportation Engineering, PHI
8. S.C. Saxena, Traffic Planning and Design, Dhanpat Rai Pub., New Delhi.

**List of Experiments:**

1. Classified traffic volume study with use of hand count, tape, video recorder
2. Spot speeds study with radar meter, enoscope
3. Travel time and delay study at Signalized intersection.
4. Parking survey
5. Road accident studies
6. Pedestrian flow survey
7. Intersection volume study
8. Analysis of traffic survey data, presentation and interpretations.
9. Traffic speed-flow-density relationship by field observations and finding Capacity & Level of service of highway section.
10. Saturation flow measurement at Signalized Intersection.
11. Design of signal for Isolated Intersection.
12. Design of co-coordinated signals.
13. Design of on Street Parking / Parking plot

**Open Ended Problems:**

1. Design of signal for Isolated Intersection – A case study of urban area
2. Design of co-coordinated signals - A case study of urban area
3. Design of on Street Parking / Parking plot – A case study of urban area

**Course Outcome:**

1. To provide detailed knowledge of traffic flow characteristics, measurement techniques and analysis.
2. To train the students, how to find the highway capacity and level of service.
3. To make aware of traffic planning, design and management techniques and impacts of traffic.
4. To impart the concepts of design of traffic control devices and traffic infrastructures.

**Field work:** Identification of problematic spots for traffic flow and suggesting suitable remedial measures. Its presentation with group discussion.

**Field visit:** A visit to Full cloverleaf junction or any other important traffic infrastructure.