



GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Master of Engineering

Level: PG

Branch: Civil Engineering (Transportation Engineering)

Course / Subject Code: ME01069011

Course / Subject Name: Traffic Engineering

w. e. f. Academic Year:	2024
Semester:	1 st Semester
Category of the Course:	PCC

Prerequisite:	Nil
Rationale:	<p>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.</p>

No	Program Outcomes
01	Engage in critical thinking and research to develop solutions to multifold real-world problems.
02	Communicate effectively with the engineering community at large level on complex design tasks & write and present technical reports.
03	Demonstrate a high level of professionalism in handling multidisciplinary and complex traffic engineering problems.
04	Plan, assess, create, integrate, carry out, and oversee complex transportation infrastructure projects in a sustainable local and global context.
05	Address societal issues pertaining to transportation by offering technologically advanced, reasonably priced solutions while upholding high standards of ethics and professionalism.



GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Master of Engineering

Level: PG

Branch: Civil Engineering (Transportation Engineering)

Course / Subject Code: ME01069011

Course / Subject Name: Traffic Engineering

Course Outcome:

After Completion of the Course, Student will be able to:

No	Course Outcomes	RBT Level
01	Understand traffic flow characteristics, measurement techniques and analysis.	R, U
02	Determine the highway capacity and level of service.	A
03	Apply techniques of traffic planning, design, management and impacts to solve the real problems.	N
04	Design traffic control devices and traffic infrastructures.	A, N

*Revised Bloom's Taxonomy (RBT)

Teaching and Examination Scheme:

Teaching Scheme (in Hours)			Total Credits L+T+ (PR/2)	Assessment Pattern and Marks				Total Marks
L	T	PR	C	Theory		Tutorial / Practical		
				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.	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, Indo-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	15
7.	Traffic Management: TSM Techniques.	3	5



GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Master of Engineering

Level: PG

Branch: Civil Engineering (Transportation Engineering)

Course / Subject Code: ME01069011

Course / Subject Name: Traffic Engineering

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	5
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
30	20	20	20	10	--

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

(a) Books:

References/Suggested Learning Resources:

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.

(b) Open-source software and website:

List of Open Source Software (May not be open source but useful for the subject):

SimTram, VISSIM, ARCADY, SIDRA

Learning website:

<http://nptel.ac.in/>

<https://ocw.mit.edu/courses/transportation-courses/>



GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Master of Engineering

Level: PG

Branch: Civil Engineering (Transportation Engineering)

Course / Subject Code: ME01069011

Course / Subject Name: Traffic Engineering

Suggested Course Practical List:

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.
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.

List of Laboratory/Learning Resources Required:

Suggested Project List: Identification of problematic spots for traffic flow and suggesting suitable remedial measures. Its presentation with group discussion.

Suggested Activities for Students: Field visit: A visit to full cloverleaf junction or any other important traffic infrastructure.

* * * * *