

**Traffic Engineering**

**01TR2102**

**(PCC)**

**Objective of the Course:**

- To introduce fundamental knowledge of traffic engineering.
- To make the students learn to deal with traffic issues including traffic safety, operation and control.

**Credit Earned: 4**

**Students learning outcomes:**

After successful completion of the course it is expected that student will be able to,

1. Identify traffic stream characteristics.
2. Design a pre-timed signalized intersection, and determine the signal splits.
3. Assess level of services of roadway facilities.

**Teaching and Examination Scheme**

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial/ Practical Marks		Total Marks
Theory	Tutorial	Practical		ESE (E)	IA (M)	CSE (I)	Viva (V)	Term Work (TW)	
03	01	00	04	50	30	20	25	25	150

**Detailed Syllabus**

Sr No.	Title of the unit	Number of hours
<b>1</b>	<b>Introduction</b>	<b>8</b>
	Components of Traffic Flow System, 3-Component System, Modern Concept in System Identification, Driver Behavior Modeling, Freeway Concept, System Performances, Measures of Effectiveness.	
<b>2</b>	<b>Traffic Analysis and Management</b>	<b>20</b>
	Capacity and Level of Service concepts, Queuing models and applications, Basics of traffic management. Traffic intersection control: Principles of Traffic Control and Traffic Signs, Road Markings and Channelization, Uncontrolled Intersection: Gap acceptance and capacity concepts, Uncontrolled Intersection: Capacity and LOS analysis, Traffic Rotaries and Grade Separated Intersection. Traffic signal design: Design Principles of Traffic Signal, Evaluation of a Traffic Signal: Delay Models, Capacity and LOS Analysis of a Signalized I/S, Coordinated Traffic Signal, Vehicle Actuated Signals and Area Traffic	

	Control.	
3	<b>Fundamentals of Traffic Management</b>	<b>17</b>
	Principles and Methodology, Traffic Systems Management, Techniques of Management, Exclusive Bus Lanes Traffic Management Techniques, Speed Control and Zoning, Parking Control, Traffic Segregation and Channelization, Principles and Design of Traffic Signs, Their Placement and Visibility	
4	<b>Transportation System Management</b>	<b>11</b>
	Route and Network Management, Area Traffic Management, City Wide Traffic Control and Management, Centralized Data Processing and Monitoring	
	<b>Total</b>	<b>56</b>

**List of Tutorials:**

- 1) Pedestrian flow survey
- 2) Analysis of traffic survey data, presentation and interpretations.
- 3) Traffic speed-flow-density relationship by field observations and finding Capacity & Level of service of highway section.
- 4) Saturation flow measurement at Signalized Intersection.
- 5) Design of signal for Isolated Intersection.
- 6) Design of co-coordinated signals.
- 7) Design of on Street Parking / Parking plot

**Suggested Theory Distribution**

The suggested theory distribution as per Bloom's taxonomy is as per follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery and evaluation					
Remember	Understand	Apply	Analyze	Evaluate	Create
05%	05%	20%	25%	25%	20%

**Instructional Method and Pedagogy:**

1. Use of Learning Management system like canvas
2. Demonstration through presentations on power point and videos and lectures
3. Brainstorming and group discussion sessions
4. Collaborative learning

**Recommended Study Material:**

**Reference Book:**

1. Adolf D. May. Fundamentals of Traffic Flow. Prentice - Hall, Inc. Englewood Cliff New Jersey 07632, second edition, 1990.
2. William R McShane, Roger P Roesss, and Elena S Prassas. Traffic Engineering. Prentice-Hall, Inc, 2010.
3. C. S. Papacostas and P. D. Prevedouros. Fundamentals of Transportation Engineering. Prentice-Hall, New Delhi, 2009.

4. C. Jotin Khisty, B. Kent Lall, Transportation Engineering: An Introduction, Prentice Hall, 2003.
5. Nicholas J. Garber, Lester A. Hoel, Traffic and Highway Engineering, Cengage Learning, 2008.
6. L. R Kadiyali. Traffic Engineering and Transportation Planning. Khanna Publishers, New Delhi, 2008.
7. D R Drew. Traffic flow theory and control. McGraw-Hill Book Company, New York, 1968.
8. Highway Capacity Manual. Transportation Research Board. National Research Council, Washington, D.C., 2010.
9. Fred L. Mannering, Scott S. Washburn and Walter P. Kilareski, Principles of Highway Engineering and Traffic Analysis, Wiley India, 2011.
10. A. S. Narasimha Murthy and Henry R. Mohle. Transportation Engineering Basics, ASCE Press, USA. 2001.
11. Thomas R. Currin, Introductions to Traffic Engineering: A Manual for Data Collection and Analysis, Brooks/Cole Thomason Learning, Canada, 2001.