Lok Jagruti Kendra University
University with a Difference

Diploma
in
Civil Engineering

LJ Polytechnic

Course Code:025050604

Traffic Engineering

Programme / Branch Name			Diploma in Civil Engineering			
Course Name	Traffic Engineering				**Course Code**	025050604
Course Type	HSSC	BSC	ESC	PCC	OEC	PEC

Legends: HSSC: Humanities and Social Sciences Courses BSC: Basic Science Courses
ESC: Engineering Science Courses PCC: Program Core Courses
OEC: Open Elective Courses PEC: Program Elective Courses

1. Teaching and Evaluation Scheme

Teaching Hours / Week				Evaluation Scheme			
L	**T**	**P**	**Total Credit**	**CCE**	**SEE (Th)**	**SEE (Pr)**	**TOTAL**
3	0	2	4	50	50	50	150

Legends:
L: Lectures T: Tutorial P: Practical
CCE: Continuous & Comprehensive Evaluation
SEE (Th): Semester End Evaluation (Theory)
SEE (Pr): Semester End Evaluation (Practical)

2. Prerequisites

- ✓ No prerequisites

3. Rationale

The spectacular growth of the automobile as one of the most convenient modes of travel has brought in its wake frustrating problems of parking, accidents, delay, congestion and environmental degradation. It is no longer sufficient to build roads of adequate structural strength to cater to the need of vehicles, but it is equally important that the safe sufficient and comfortable movement of traffic and other road user is ensured on these roads. This need has given birth to new branch of engineering known as traffic engineering. Traffic engineering is the phase of transportation engineering that deals with the planning, geometric design and traffic operations of roads, streets and highways, their networks, terminals and relationships with other modes of transportation.

4. Objectives

- ✓ To understand about traffic growth and concept of organizing structure of transport department.
- ✓ To understand the concepts of traffic surveys, data collection and analysis.
- ✓ To gain knowledge of various traffic control devices and their utilization in road network.
- ✓ To know the importance of road safety and traffic management measures.
- ✓ To study different types of TSM techniques and parking facilities.

5. Contents

Unit No.	Unit Name	Topics	Learning Outcomes	% Weightage	Hours
1.	**Introduction**	1.1. Traffic Engineering Administration and Functions- Definition 1.2. Growth of the Subject of Traffic Engineering 1.3. Functions 1.4. Organisation of Traffic Engineering Department 1.5. The Road User and the Vehicles- Introduction 1.6. Human Factors Governing Road User Behavior 1.7. Other Vehicle Characteristics 1.8. Characteristics of Slow Moving Traffic in India	• Knowledge about Growth of Traffic, Functions of Traffic Engineering Departments and Organization Structure. • Classify the Road User and Vehicular Characteristics.	10	5
2.	**Traffic Survey**	2.1. Speed Journey Time and Delay Surveys- Introduction 2.2. Use of Speed, Journey Time and Delay Studies 2.3. Methods of Measuring Spot Speeds 2.4. Methods for Measurement of Running Speed and Journey Speed 2.5. Delay Studies 2.6. Vehicle Volume Counts, Classification and Occupancy- Need 2.7. Types of Count 2.8. Method Available for Traffic Counts 2.9. Origin Destination Survey- Need 2.10. Survey Methods (Origin Destination Survey) 2.11. Presentation of Results 2.12. Parking Survey- Need 2.13. Definition of Common Terms 2.14. Types of Parking	• Understand the Importance of Traffic Surveys. • Gain Detailed Knowledge about Traffic Study and Analysis of Survey Data. • Perform Traffic Surveys.	25	10

		Surveys			
3.	**Traffic Controls**	3.1. Traffic Signs- Importance 3.2. Need for International Standardization 3.3. General Principles of Traffic Signing 3.4. Types of Traffic Signs 3.5. Road Marking- Functions 3.6. Types of Road Markings 3.7. General Principles of Longitudinal Pavement Marking 3.8. Material and Colour 3.9. Traffic Signals- Introduction 3.10. Advantages and Disadvantages of Traffic Signals 3.11. Pedestrian Signal Indication 3.12. Signal Face 3.13. Amber Period, Red/Amber Period and Intergreen Period 3.14. Fixed Time Signal and Vehicle Actuated Signals 3.15. Co-ordinated Control of Signals 3.16. Miscellaneous Traffic Control Aids and Street Furniture- Background 3.17. Principles of Street Furniture Design	• Learn about different Traffic Signs and Markings. • Understand Signal Designing at Intersection. • Classify Traffic Control Aids and their principles of designing criteria.	35	15
4.	**Road Accidents- Causes and Prevention**	4.1. Road Accidents- Causes and Preventions 4.2. Road Accident and the Traffic Engineer 4.3. Collection of Accident Data 4.4. Road and its Effects on Accidents 4.5. Traffic Management Measures and their Influence in Accident Prevention	• Understand Causes and Prevention of Road Accidents. • Identify the Data Collection of Accident Report. • Knowledge about Traffic Management Measures and their Influence in Accident Prevention	15	6

		4.6. Legislation, Enforcement, Education and Propaganda			
5.	**Traffic Management and Parking**	5.1. Transportation System Management- Introduction 5.2. Travel Demand Management 5.3. Traffic Management 5.4. Parking-Traffic and Parking Problems 5.5. Ill-effects of Parking 5.6. Design Standards for On-street Parking Facilities 5.7. Traffic Regulatory Measures for On-street Parking 5.8. Off-street Parking Facilities	• Knowledge about TSM Techniques and Travel Demand Management. • Understand Parking Facilities and Traffic Regulatory Measures.	15	6
				Total Hours	**42**

6. List of Practicals / Exercises

The practicals/exercises have been properly designed and implemented in an attempt to develop different types of skills so that students can acquire the competencies/programme outcomes. Following is the list of practicals/exercises.

Sr. No.	Practical / Exercises	Key Competency	Hours
1.	Draw the sketches of traffic signs, traffic signals and road marking, traffic control aids.	Knowledge of Traffic Control Devices, Street Furniture	10
2.	Perform traffic volume survey at given intersection.	Calculate Volume Count	2
3.	Carry out origin and destination study for given area.	Prepared Desire Line Diagram and OD Matrix	2
4.	Conduct a spot speed study on a particular stretch of road and determine average speed of traffic.	Calculate Average Speed	2
5.	Prepare a detailed report on traffic control aids located in Ahmedabad city.	Microsoft Word Skill	2
6.	Prepare a detailed report on traffic signs located in Ahmedabad city.	Microsoft Word Skill	2
7.	Compute signal cycle time by any method from given data.	Knowledge of Traffic Control Devices, Street Furniture	2
8.	Seminar- The topic of the seminar shall be given to a group of students.	Microsoft Power Point Skill	6
		Total Hours	**28**

7. Suggested Specification Table for Evaluation Scheme

Unit No.	Unit Name	Distribution of Topics According to Bloom's Taxonomy					
		R %	U %	App %	C %	E %	An %
1.	Introduction	10	48	30	0	0	12
2.	Traffic Survey	28	40	24	0	0	10
3.	Traffic Controls	35	45	10	0	0	10
4.	Road Accidents- Causes and Prevention	40	45	15	0	0	0
5.	Traffic Management and Parking	35	50	15	0	0	0

Legends: R: Remembering U: Understanding
App: Applying C: Creating
E: Evaluating An: Analyzing

8. Textbooks

1) Traffic Engineering by Dr. L. R. Kadiyali, Khanna Publishers.

9. Reference Books

1) Traffic planning and design by S C Saxsena, Dhanpat Rai & Sons Delhi.
2) Transportation Engineering Vol. I & II by V N Vazirani & S P Chaondola, Khanna Publishers, Delhi.
3) Traffic Engineering: Theory and practice by L J Pingnataro, Prentice Hall, Englewood.
4) Principles of Transportation Engineering by Chakraborty, Partho and Animesh Da, P H I Learning.

10. List of Publications

1) Indo-Highway Capacity Manual, 2018.
2) IRC-SP -12 2015 Parking Facilities in Urban Roads.
3) IRC SP - 41 Guidelines for the Design of At-Grade Intersection.
4) IRC 35 - 2015 Code of Practice for Road Markings – Second Revision
5) IRC 67 - 2001 Road Signs.
6) IRC 108 - 2015 Guidelines for Traffic Forecast on Highways.
7) IRC 119 - 2015 Guidelines for Traffic Safety Barriers.
8) IRC 65 - 1976 Traffic Rotaries.
9) IRC 93 - 1985 Design & Installation of Road Traffic Signals.
10) Highway Capacity Manual, Special Report 97, Highway Research Board, Washington, 1965.
11) United Nations, Manual on Traffic Surveys, New Delhi.
12) I.S.: 7537-1974 for Specification of Rad Traffic Signals.
13) The Design Council Catalogue for Street Furniture, The Design Council of U.K. 1979.
14) Development of Aesthetic Designs for Road Side Furniture, State of Art Report, Prepared for Ministry of Road Transport, New Delhi, 1996.
15) IS Codes for Testing Construction Materials.
16) Traffic System Analysis for Engineers and Planners by Martin Whol, Brian V Martin, McGraw Hill, NY, 1967.

11. Open Sources (Website, Video, Movie)

1) www.nptel.ac.in
2) LJP-Civil-Traffic Engineering (YouTube)