



Subject: Road Safety and Management– BETCV14313

Type of course: Minor Stream

Prerequisite: Building and Town Planning

Rationale: To set a compact foundation in the field of traffic engineering, its management in order to achieve the safety to the road users., To enable the students to apply the basic principles of traffic engineering in the design of traffic facilities based on traffic flow theory., To equip the students for traffic system management in the urban area., 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
CI	T	P	C	Theory Marks		Practical Marks		CA	
				ESE	MSE	V	P	ALA	
03	00	00	03	60	30	10	0	50	150

Legends: CI, Class Room Instructions; T – Tutorial; P, Practical; C – Credit; ESE, End Semester Examination; MSE, Mid Semester Examination; V – Viva; CA, Continuous Assessment; ALA, Active Learning Activities.

Course Content:

Sr. No	Course Content	Hrs.	% Weightage
1	Introduction: Traffic engineering administration and functions, Organization of the traffic engineering department, Road user and vehicular characteristics.	05	10
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.	05	10



3	Traffic Forecasting, Light hill and Witham's Theory: Need for traffic forecasting, Types of traffic, Forecasts based on past trends and extrapolation, period for forecasting. General, Assumption, Theory, Approach to signalized intersection, Bottleneck, Car following theory, Queuing theory concept. 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.	15	30
4	Parking studies and Design of Intersection: 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., 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., 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	15	40
5	Traffic Accidents – Causes and prevention: Accident situation in India, Collection of accident data, Statistical methods for analysis of accident data, Road and its 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.	05	10

Continuous Assessment:

Sr. No	Active Learning Activities	Marks
01	Traffic Simulation and Analysis If resources allow, use traffic simulation software to model the designed system and analyze its impact. Students will adjust variables (e.g., signal timing, speed limits) to optimize traffic flow and safety. Discuss the results and propose improvements.	10
02	Road Safety and Traffic Management Design. Based on the collected data, students will be divided into teams. Each team will: Identify problem areas (high-accident zones, traffic bottlenecks, pedestrian safety issues, etc.) Suggest engineering solutions (e.g., road widening, improved signage, speed bumps, pedestrian crossings, roundabouts, etc.). Design a traffic management system, including signal timings, lane allocations, and safety measures like lighting and guardrails.	10



03	Site Assessment and Data Collection Take students to a nearby busy road or intersection, if possible, or ask them to collect traffic data and accident history for a specific area. Gather data on traffic volume, peak traffic hours, types of accidents, and road conditions. Alternatively, use available online resources or local traffic department reports.	10
04	Smart city in worldwide List out various smart transport system by individual students for smart cities and upload report in portal.	10
05	breakdown structure of Smart city Prepare breakdown structure by individual students for different units of the smart city and upload report in portal.	10
Total		50

Suggested Specification table with Marks (Theory): 60

Distribution of Theory Marks (Revised Bloom's Taxonomy)						
Level	Remembrance (R)	Understanding (U)	Application (A)	Analyze (N)	Evaluate (E)	Create (C)
Weightage	30%	30%	30%	10%	,	,

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 lightly from above table.

Course Outcome:

After learning the course the students should be able to:	
CO1	Determine the traffic flow parameters for traffic management.
CO2	Predict the future traffic demand for the urban and rural area.
CO3	Plan the parking plots as per the traffic availability in the urban area.
CO4	Design the various types of intersection in the urban area.
CO5	Propose the different types of traffic system management technique.

Instructional Method:

The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.

From the content 10% topics are suggested for flipped mode instruction.

Students will use supplementary resources such as online videos, NPTEL/SWAYAM videos, e, courses, Virtual Laboratory



The internal evaluation will be done on the basis of Active Learning Assignment

Practical/Viva examination will be conducted at the end of semester for evaluation of performance of students in laboratory.

Reference Books:

- [1] Traffic Engineering and Transportation planning, L R Kadiyali, Khanna Publishers. Delhi
- [2] Kadiyali, L.R., Traffic Engineering & Transport Planning, Khanna Publishers, New Delhi.
- [3] Kadiyali, L.R. & Lal, N.B., Principles & Practices of Highway Engineering, Khanna Publishers, New Delhi.
- [4] Sharma, S.K., Principles, Practice and Design of Highway Engineering, S. Chand & Co., New Delhi
- [5] Traffic planning and design, S C Saxsena, Dhanpat Rai & Sons Delhi
- [6] Transportation Engineering, Vol. I & II, V N Vazirani & S P Chaondola, Khanna Publishers. Delhi
- [7] IRC:70, 1977: "Guidelines on Regulation and Control of Mixed Traffic in Urban Areas"
- [8] IRC:106, 1990: "Guidelines for Capacity of Urban Roads in Plain Areas"
- [9] IRC-73
- [10] IRC-12

