



Gyanmanjari
Innovative University

Course Syllabus
Gyanmanjari Institute of Technology
Semester-6 (B. Tech.)

Subject: Traffic Engineering and Management – BETCV16332

Type of Course: Professional Elective

Prerequisite: Knowledge of Transportation Engineering

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		Theory Marks		Practical Marks		CA	
				ESE	MSE	V	P	ALA	
3	0	2	4	60	30	10	20	30	150

Legends: CI-Classroom 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	Basic of Traffic Engineering and Traffic Surveys Basic of Traffic Engineering: Traffic engineering administration and functions, Organization of the traffic engineering department, Road user and vehicular characteristics. 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.	10	20
2	Traffic Forecasting and Parking studies Traffic Forecasting: Need for traffic forecasting, Types of traffic, Forecasts based on past trends and extrapolation, period for forecasting. Parking studies: 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.	05	15
3	Design of Intersection and Traffic Regulation Design of Intersection: Design of at grade & grade separated intersection, rotary intersection, capacity of rotary intersection. Traffic Regulation: Traffic control devices, Traffic Signs, Road Markings, 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.	10	20
4	Traffic flow parameter and Traffic Accidents Traffic flow parameter: Definition, Flow, Volume, Speed, Space headway, Time headway, Density, Relationship between Flow, Speed and Density, Lighthill and Witham's Theory - General, Assumption, Theory, Approach to signalized intersection, Bottleneck, Car following theory, Queuing theory concept. Traffic 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.	10	25
5	Traffic system management and Highway Capacity Traffic system management: 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. Highway Capacity: Importance of 'Capacity' in Highway transportation studies, , 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.	10	20



Continuous Assessment:

Sr. No.	Active Learning Activities	Marks
1	Traffic Volume Count Activity Students will stand at a nearby junction and record the number and types of vehicles passing in reference point. Each student will prepare a detailed report and submit it on the GMIU Web Portal.	10
2	Parking Survey in Campus Students will conduct a parking survey in nearby public building area to record number of vehicles parked, duration, and space used. And complete report of Survey submits on the GMIU Web Portal.	10
3	Traffic Safety Awareness Students will work in small groups to choose a traffic-related topic such as road safety measures, accident prevention, parking solutions, traffic calming techniques etc. Each group will collect relevant information through field visits, surveys, or online research and prepare a presentation and submit it on the GMIU Web Portal.	10
TOTAL		30

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 %	10%	20%	20%	20%	10%	20%

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 vary slightly from above table.

Course Outcome:

After learning the course, the students should be able to:	
CO1	Explain the fundamentals of traffic engineering, traffic characteristics, and conduct various traffic surveys.
CO2	Analyze traffic forecasting methods and design efficient parking systems based on standard guidelines.
CO3	Design and evaluate intersections with appropriate traffic control devices and signal coordination techniques.
CO4	Identify Traffic flow parameter, causes of traffic accidents and propose effective prevention and management.
CO5	Assess highway capacity, level of service, and apply intelligent traffic system (ITS) concepts for efficient traffic management.



List of Practical

Sr. No.	Descriptions	Unit No.	Hrs.
01	Observation of Road User and Vehicular Characteristics	1	02
02	Manual Classified Traffic Volume Count Survey	1	04
03	Forecasting of Traffic Volume by Growth Rate Method	2	02
04	Observation of On-Street Parking in a Market Area	2	02
05	Sketch of a Simple Four-Arm Intersection Showing Traffic Flow Directions	3	04
06	Identification and Sketching of Traffic Signs	3	02
07	Study of Flow–Speed–Density Relationship (Using Given Data)	4	04
08	Collection of Accident Data and Preparation of Collision Diagram	4	02
09	Preparation of a One-Way Traffic Plan for a College or Market Area	5	04
10	Observation of Traffic Flow to Estimate Road Capacity	5	04
TOTAL			30

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 the laboratory.

Reference Books:

- [1] Traffic Engineering and Transportation Planning – L.R. Kadiyali, Khanna Publishers
- [2] Highway Engineering – S.K. Khanna & C.E.G. Justo, Nem Chand & Bros.
- [3] Transportation Engineering – Dr. S.P. Chandola, S. Chand & Company Pvt. Ltd.
- [4] Traffic Engineering – Nicholas J. Garber & Lester A. Hoel, Cengage Learning
- [5] Principles of Highway Engineering and Traffic Analysis – Fred L. Mannering & Scott S. Washburn, Wiley India Pvt. Ltd.

