

DEPARTMENT OF CIVIL ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

COURSE PLAN - PART I			
Name of the programme and specialization	M. Tech. (Transportation Engineering and Management)		
Course Title	HIGHWAY TRAFFIC ANALYSIS AND DESIGN		
Course Code	CE601	No. of Credits	3
Course Code of Pre-requisite subject(s)	Nil	Semester	I
Session	July 2023	Section (if, applicable)	-
Name of Faculty	Dr. Marisamynathan S	Department	Civil Engineering
Email	marisamy@nitt.edu	Telephone No.	0431-250 3153
Name of Course Coordinator(s) (if, applicable)	NA		
E-mail	NA	Telephone No.	NA
Course Type	<input checked="" type="checkbox"/> Core course	<input type="checkbox"/> Elective course	

Syllabus (Approved in BoS)

Elements of Traffic Engineering - road user, vehicle and road way and driver characteristics. - Design speed, volume. Passenger Car Units - Static and Dynamic - Highway capacity and level of service - capacity of urban and rural roads - Road user facilities - Parking facilities - Cycle tracks - Pedestrian facilities.

Traffic volume studies, origin destination studies, speed studies, travel time and delay studies, Parking studies, Accident studies. Big data – collection and analysis.

Elements of design - Alignment - Cross sectional elements - Stopping and passing sight distance. Horizontal curves - Vertical curves. Design problems. Traffic regulation and control - Signs and markings - Traffic System Management.

Design of intersections – At-grade intersections- Principles of design – Channelization - Design of rotaries - Traffic signals - pre-timed and traffic actuated. Design of signal setting - phase diagrams, timing diagram – Signal co-ordination – Area traffic Control System. Grade separated interchanges - Geometric elements for divided and access-controlled highways and expressways.

Traffic Safety – Principles and Practices – Safety along links - Safety at intersections. Road Safety Audit – Countermeasures, evaluation of effectiveness of counter-measures– Road safety programmes. Traffic Impact Assessment.

References

1. ITE Hand Book, Highway Engineering Hand Book, Mc Graw - Hill.
2. AASHTO A Policy on Geometric Design of Highway and Streets
3. Pignataro, L.J., Traffic Engineering – Theory & Practice, John Wiley, 1985

4.	R. J. Salter and N. B. Hounsel, Highway Traffic Analysis and Design, Macmillan Press Ltd, 1996.		
5.	Indo-HCM, 2018 and relevant IRC codes		
COURSE OBJECTIVES			
<ul style="list-style-type: none"> To understand the concepts of highway capacity To be aware of various methods of collecting traffic data To understand the basics of highway planning and design, and workout problems in design of road geometrics To learn the principles of intersection design To learn the importance of road safety 			
COURSE OUTCOMES (CO)			
Course Outcomes			Aligned Programme Outcomes (PO)
Ability to apply the concept of capacity			1, 2, 8
Skill to conduct traffic surveys			1, 4, 6
Capability to design the highway geometrics			1, 2, 3, 5, 7, 9
Capability to design the intersections			1, 2, 3, 5, 7, 9
Ability to build safety into every aspect of design			1, 2, 3, 5, 7, 9, 10
COURSE PLAN - PART II			
COURSE OVERVIEW			
The course gives overall view of the highway planning, geometric design, traffic engineering concepts, pavement engineering and tests on pavement materials.			
COURSE TEACHING AND LEARNING ACTIVITIES			
S.No.	Week/Contact Hours	Topic	Mode of Delivery
1	Week 1	Elements of Traffic Engineering - road user, vehicle and road way and driver characteristics	Board & Chalk, PPT, and Videos
2	Week 2	Design speed, volume. Passenger Car Units - Static and Dynamic - Highway capacity and level of service	
3	Week 3	capacity of urban and rural roads - Road user facilities - Parking facilities - Cycle tracks - Pedestrian facilities	
4	Week 4	Traffic volume studies, origin destination studies, speed studies,	
5	Week 5	Travel time and delay studies, Parking studies	
6	Week 6	Accident studies. Big data - collection and analysis.	
7	Week 7	Elements of design - Alignment - Cross sectional elements - Stopping and passing sight distance.	
8	Week 8	Horizontal curves - Vertical curves. Design problems.	

9	Week 9	Traffic regulation and control - Signs and markings - Traffic System Management.
10	Week 10	Design of intersections – At-grade intersections- Principles of design – Channelization -
11	Week 11	Design of rotaries - Traffic signals - pre-timed and traffic actuated.
12	Week 12	Design of signal setting - phase diagrams, timing diagram – Signal co-ordination – Area traffic Control System.
13	Week 13	Grade separated interchanges - Geometric elements for divided and access-controlled highways and expressways.
14	Week 14	Traffic Safety – Principles and Practices – Safety along links - Safety at intersections
15	Week 15	Road Safety Audit – Countermeasures, evaluation of effectiveness of counter-measures– Road safety programmes. Traffic Impact Assessment.

COURSE ASSESSMENT METHODS (shall range from 4 to 6)

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Assessment 1	Week 7	1 hour	20
2	Assessment 2	Week 13	1 hour	20
3	Class Activity	-	--	10
4	Quiz	Week 15	20 Min	10
CPA	Compensation Assessment	Week 15	1 hour	20
5	Final Assessment	Week 17	3 hours	40

COURSE EXIT SURVEY (mention the ways in which the feedback about the course shall be assessed)

The Feedback form will be collected from the students in Week 13.

COURSE POLICY (preferred mode of correspondence with students, compensation assessment policy to be specified)

MODE OF CORRESPONDENCE (email/ phone etc)
marisamy@nitt.edu

COMPENSATION ASSESSMENT POLICY

1. Attending all the assessments including submission of all assignments are **MANDATORY** for every student.
2. If any student is not able to attend Assessment-1 and/or Assessment-2 due to genuine reason, student is permitted to attend the only one compensation assessment with 20% weightage. The portion for such compensation assessment will be combined portion of Assessment-1 and Assessment-2.
3. At any case, compensation assessment will not be considered as an improvement test.

GRADING: Grading should be as per the Institute norms. Passing minimum is 35% or (Class average/2) whichever is greater

ATTENDANCE POLICY (A uniform attendance policy as specified below shall be followed)

- **At least 75% attendance in each course is mandatory.**
- **A maximum of 10% shall be allowed under On Duty (OD) category.**
- Students with **less than 65% of attendance** shall be prevented from writing the final assessment and **shall be awarded 'V' grade.**


ACADEMIC DISHONESTY & PLAGIARISM


- Possessing a mobile phone, carrying bits of paper, talking to other students, copying from others during an assessment will be treated as punishable dishonesty.
- Zero mark to be awarded for the offenders. For copying from another student, both students get the same penalty of zero mark.
- The departmental disciplinary committee including the course faculty member, PAC chairperson and the HoD, as members shall verify the facts of the malpractice and award the punishment if the student is found guilty. The report shall be submitted to the Academic office.

The above policy against academic dishonesty shall be applicable for all the programmes.

ADDITIONAL INFORMATION

FOR APPROVAL


Course Faculty _____
[MARISAMY NADHAN S.]


CC-Chairperson _____
(R. SENTHIL KUMAR)


HOD _____