

CE774 (3 0 0 6) - Traffic Management and Design (2022)

Prof. Tom V. Mathew

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(PDF - for better view)

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1 Overview

1.1 Eligibility

1. This is a 6 credit elective course with CE-334 or CE-740 as pre-requisite.
2. This course is running in Slot 1 and has three lectures per week
 - (a) Slot 1 A - Mon - 08:30 - 09:25
 - (b) Slot 1 B - Tue - 09:30 - 10:25
 - (c) Slot 1 C - Thu - 10:30 - 11:25
3. Only 60 students are allowed to register for this course

1.2 Course contents

Note: Some minor modifications can be expected.

1. Traffic Impact

- (a) **Toll operation:** Design and configuration, queuing characteristics, operation and maintenance issues.
- (b) **Congestion studies:** Performance measures, intensity, duration, extent of congestion, traveler perception, remedial measures, congestion pricing.
- (c) **Parking Studies:** Parking inventory, statistics, parking surveys; in-out, license plate, on-street and off-street parking.
- (d) Fuel Consumption and vehicle operating cost.
- (e) Vehicular emission and Air quality modelling.
- (f) Traffic safety: Accident studies, Accident data analysis, Statistical methods.
- (g) Transportation noise: standards, measurements and mitigation strategies.

2. Capacity and LOS Analysis for Design of Traffic Facilities (HCM 2000)

- (a) **Signalized Intersection**
- (b) **Freeway Operations and design**
- (c) Urban Streets, Two Lane and Multilane Highways
- (d) Transit route selection and design
- (e) Pedestrians and bicycles facilities
- (f) Intersection, roundabout configuration and design
- (g) Expressways and **Freeways**
- (h) Interchange design, **Freeway Operations and design**
- (i) Uncontrolled intersection: critical gap, capacity, queue, and delay.

3. Traffic Management

- (a) **Discrete simulation models: Cellular automata concepts, discretization of time and space, rules for acceleration, deceleration, randomization, and vehicle updating.**
- (b) Cell transmission models: Flow conservation, flow transmission.
- (c) **Traffic progression models: Robertson progression model, platoon movement, dispersion index, applications.**

- (d) **Traffic Management Strategies, Traffic Management Techniques**
- (e) **Work zone traffic management**
- (f) **Traffic calming**

4. **Automated Data Collection Systems**

- (a) **Intrusive systems such as loop detectors, pneumatic, etc.,**
- (b) **Non-Intrusive systems such as video, infrared**
- (c) **In-vehicle systems: GPS, Mobiles,** Tracking; Positioning systems for location services
- (d) Geographical information systems

5. **Intelligent Transportation System**

- (a) **ITS: User services and architecture**
- (b) **ITS: Standards and evaluation**
- (c) **Public transport and bus priority**
- (d) Travel time estimation methods
- (e) Artificial intelligence in advanced traffic and ITS

1.3 **Evaluation**

Type	Marks	Remarks
Quizzes	25.0 ± 5	By on line polls
Assignments	25.0 ± 5	Including Excel
Mid Sem	20.0 ± 5	
End Sem	30.0 ± 5	
Total	100	

Note: There can be atmost plus or minus 5 variation in the above distribution. Students are expected to have 80% or more attendance in the lectures.

1.4 **Assignments**

1.4.1 **Assignmnet 1**

1. Download the questions from [here](#).
2. Deadline: 2022 Mar 02 at 23:59 PM
3. Submission link: To be provided by TA

1.4.2 Assignmnet 2

1. Download the questions from [here](#) (Q4 Not required).
2. Deadline: 2022 Mar 09 at 23:59 PM
3. Submission link: To be provided by TA

1.4.3 Assignmnet 3

1. Download the questions from [here](#).
2. Deadline: 2022 Mar 30 at 23:59 PM
3. Submission link: To be provided by TA

1.4.4 Assignmnet 4

1. Download the questions from [here](#).
2. Deadline: **2022 Apr 17 at 23:59 PM.**
3. Submission link: To be provided by TA

2 Resources

1. [Link to Videos.](#)
2. [Link to Lecture Notes.](#)

References

- [1] D R Drew. *Traffic flow theory and control*. McGraw-Hill Book Company, New York, 1968. IITB-.
- [2] Highway Capacity Manual. *Transportation Research Board*. National Research Council, Washington, D.C., 2000.
- [3] L. R Kadiyali. *Traffic Engineering and Transportation Planning*. Khanna Publishers, New Delhi, 1987.
- [4] S K Khanna and C E G Justo. *Highway Engineering*. Nemchand Bros., Roorkee, 1991.

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- [6] Adolf D. May. *Fundamentals of Traffic Flow*. Prentice - Hall, Inc. Englewood Cliff New Jersey 07632, second edition, 1990.
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- [9] M Whol and B V Martin. *Traffic system analysis for engineers and planners*. McGraw Hill, Inc., 1983.