

Traffic Engineering

CIVE5305

Carleton University
DEPARTMENT OF CIVIL &
ENVIRONMENTAL ENGINEERING

2020

Course Learning Objectives

1. To cover the principles and methods of traffic engineering.
2. To highlight traffic safety measures and environmental factors.
3. To describe intelligent transportation systems (ITS) as these relate to traffic engineering.
4. To introduce automation in driving.
5. To introduce traffic software that are currently in use or under development.

CIVE 5305 - Traffic Engineering

Learning Outcomes (General Statement)

It is expected that this course will bring into focus both concepts and methods that contribute to the safe, efficient and environmentally sustainable movement of road traffic.

Learning Outcomes (LOs)

It is intended that in this course, a contribution will be made to the following learning outcomes

LO	Description
LO1	Analysis of engineering problems
LO2	Conducting research in engineering
LO3a	Development of methodologies, tools, or engineering systems
LO3b	Application of methodologies, tools, engineering systems
LO4a	Effectively synthesize a relevant body of knowledge to peers and/or practicing engineers
LO4b	Effectively communicate a relevant body of knowledge to peers and/or practicing engineers

Learning Outcomes (LOs)

It is intended that in this course, a contribution will be made to the following learning outcomes

LO	Description
LO5a	Tackle, in some depth, engineering problems
LO5b	Tackle a wide range of engineering problems

CIVE5305 Traffic Engineering
Hours/Week: Lecture 3 Hours

<u>WEEK</u>	<u>TOPIC</u>
1	Introduction to transportation systems, traffic engineering, emerging issues and trends in traffic engineering, environmental factors, Intelligent Transportation Systems (ITS), automation in driving, sustainable transportation.
2,3	Traffic stream components and characteristics: basic characteristics of drivers, and traffic. Queueing of traffic. Geometric characteristics of roadways. traffic control devices. Traffic streams.

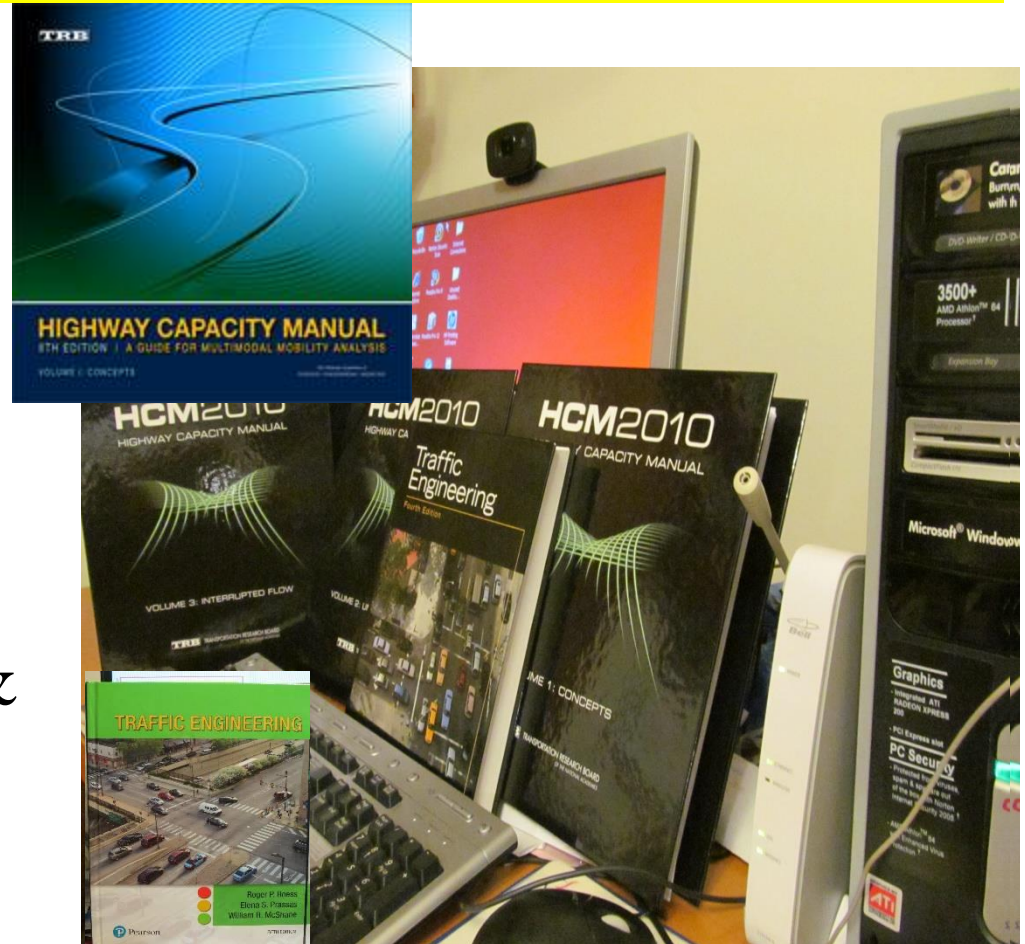
CIVE5305 Traffic Engineering
Hours/Week: Lectures 3 Hours

<u>WEEK</u>	<u>TOPIC</u>
4,5	Traffic studies: introduction and overview. Statistics and applications in traffic engineering; volume, speed, travel time and delay; parking
6	Accident studies.
7	Capacity analysis of roads and intersections.
8-11	Traffic control: intersections, networks. Traffic management. Environmental impacts. Traffic simulation.
12	Traffic simulation.

Frequently Used Book & Reference Manual

Roses, R.P., Prassas, E.S., McShane, W.R., Traffic Engineering. Fifth Edition. Pearson 2019.

Transportation Research Board (TRB). Highway Capacity Manual 2010 & 2016. National Research Council, Washington, D.C.



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TEXT BOOKS & REFERENCES (Subject to change)

Roess, R.P., Prassas, E.S., McShane, W.R., Traffic Engineering. Fifth Edition. Pearson 2019.

[eText Version and Hard Copy Version: Available from Carleton University Book Store. Note: students could either opt for in store pick-up or order from website (www.carletonshop.ca) and will receive it within two business days (anywhere in Canada).

Banks, James, H. Introduction to Transportation Engineering. 2nd Edition. McGraw-Hill. 2002.

Kyte, M. and Tribelhorn, M. Operation, Analysis, and Design of Signalized Intersections: A Module for the Introductory Course in Transportation Engineering. First Edition.

Papacostas, C.S. and P.D. Prevedouros. Transportation Engineering and Planning. Latest Edition. Prentice Hall.

Hoel, A.H., Garber, N.J. and Sadek, A.W. Transportation Infrastructure Engineering, A Multimodal Approach. Thomson/Nelson. 2007/2008.

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TEXT BOOKS & REFERENCES (Cont.)

Mannering, F.L., Kilareski, W.P., and Washburn, S.S. Principles of Highway Engineering and Traffic Analysis. Third Edition, John Wiley & Sons, Inc. 2005.

Garber, Nicholas J. and Lester A. Hoel. Traffic and Highway Engineering. Fourth (SI) Edition. CENGAGE Learning, 2010.

Transportation Research Board (TRB). Highway Capacity Manual 2016 & 2010. National Research Council, Washington, D.C.

Transportation Association of Canada (TAC). Geometric Design for Canadian Roads. See the latest edition and supplements.

Council for Uniform Control Devices for Canada/Distributed by the Transportation Association of Canada. Uniform Traffic Control Devices for Canada. Metric Edition (latest edition).

Senate of Canada, Driving Change: Technology and the future of the automated vehicles. Ottawa, 2018.

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TEXT BOOKS & REFERENCES (Cont.)

Currin, Thomas R. Introduction to Traffic Engineering: A Manual for Data Collection and Analysis. 2001. Brooks/Cole, Thomson Learning.

Web-based Course on Fundamentals of ITS and Traffic Management

(<http://www.citeconsortium.org/WebCT/priv/linx2class.htm>)

IMPORTANT SOURCES OF INFORMATION (subject to change)

Institute of Transportation Engineers (www.ITE.ORG).

Transportation Research Board (TRB) (<http://nas.edu/trb>) [Use TRIS-on line for Transportation Research Information Service for literature search].

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IMPORTANT SOURCES OF INFORMATION

(Cont.)

Intelligent Transportation Systems Society of Canada
(ITS Canada) (www.ITSCANADA.ca)

ITS America (<http://www.itsa.org/>)

Transportation Association of Canada (TAC)
(www.tac-atc.ca)

WORKLOAD & MARKING SCHEME

Assignments 20%

Term Paper/Research Paper/Mini-project 40%

Final (Take Home) Examination 40%

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COURSE INSTRUCTOR

Professor Ata M. Khan

Contact by email: ata.khan@carleton.ca

Telephone for consultation purposes: 613 733 0094

Following COVID-19 Era

Room 7064 Minto Centre (For reference purposes)

Telephone: 613 520 2600 (5786) (For reference purposes only; not checked regularly)

Email: ata.khan@carleton.ca

Announcements

1. Accommodations

“The Paul Menton Centre for Students with Disabilities (PMC) provides services to students with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability requiring academic accommodations in this course, please contact PMC at 613-520-6608 or pmc@carleton.ca for a formal evaluation. If you are already registered with the PMC, contact your PMC coordinator to send me your *Letter of Accommodation* at the beginning of the term, and no later than two weeks before the first in-class scheduled test or exam requiring accommodation (*if applicable*). **Requests made within two weeks will be reviewed on a case-by-case basis.** After requesting accommodation from PMC, meet with me to ensure accommodation arrangements are made. Please consult the PMC website (www.carleton.ca/pmc) for the deadline to request accommodations for the formally-scheduled exam (*if applicable*). “

Share: [Twitter](#), [Facebook](#)

Short URL: <https://carleton.ca/pmc/?p=492>

Announcements (Continued)

Other Academic Accommodation

***Pregnancy obligation:** write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details visit the Equity Services website*

<http://www2.carleton.ca/equity/accommodation/>

***Religious obligation:** write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details visit the Equity Services website*

<http://www2.carleton.ca/equity/accommodation/>

Announcements (Continued)

2. Marked Final Examination Papers

Marked final examinations will not be returned.

3. Students Who Wish to Audit the Course

Please refer to Carleton University regulations.

Announcements (Cont.)

4) Intellectual Property

"Classroom teaching and learning activities, including lectures, discussions, presentations, etc., by both instructors and students, are copy protected and remain the intellectual property of their respective author(s). All course materials, including PowerPoint presentations, outlines, and other materials, are also protected by copyright and remain the intellectual property of their respective author(s)."

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