Civil Engineering
CIVENG 3K03
Introduction to Transportation Engineering
Fall 2023

Instructor Information

Dr. Saiedeh Razavi
Email: razavi@mcmaster.ca
Office Hours:
Weekdays by Appointment

Course Information

Lectures: Wednesdays 1:30 PM - 2:20 PM & Fridays 1:30 PM - 2:20 PM

Tutorials: Wednesdays 8:30 AM - 10:20 AM or Tuesdays. 10:30 AM - 12:20 PM

Course Dates: 09/05/2023 - 12/06/2023
Units: 3.00
Course Delivery Mode: In Person
Course Description: A transportation impact study serves as the focus for group projects, and provides the context for application of material on traffic flow characteristics, capacity and control for signalized and unsignalized intersections, and travel demand forecasting. Safety; social impacts. Two lectures, one tutorial (two hours); first term
Prerequisite(s): Registration in Level III or above of any Engineering program

Instructor-Specific Course Information

- All formal communications regarding this course will be through McMaster's e-mail account and/or Avenue to Learn. Please be sure to check your McMaster account

regularly. If you have not received e-mails regarding 3K03, it is your responsibility to contact the course coordinator with your McMaster e-mail address and ensure your name is on the distribution list. Similar information will be posted on Avenue to Learn.

- The E-mail subject line must start with the course number (otherwise, your e-mail will be filtered out) followed by a colon and includes a relevant description of the content in the e-mail (e.g., 3K03: Assignment 1 question).
- Following this policy, students may expect a response from the TAs within two business days or from the instructor in three business days. E-mails that do not follow this policy may not receive a response.
- You are encouraged to discuss the feedback you receive on your assignments with the course TA and instructor. If you believe you received incorrect grades, you must immediately contact the teaching team with an e-mail explanation. This process should be no later than one week after the assignment is returned. The roles and responsibilities of the teaching team will be posted on the A2L course webpage so that the students direct their questions to the relevant person.
- Periodically, you will be asked to provide feedback on your experience during this course, including your opinion on the effectiveness of the lectures, tutorials, and assignments in contributing to your learning. This feedback will be solicited to help improve your experience, so it is in your best interest to make this feedback as informative, constructive, and respectful as possible.

Meeting Details

Attending lectures and tutorials is mandatory.

Our goal is to provide an environment that is free of discrimination and harassment, as well as that supports you to become competent in transportation engineering. Therefore, we have the following expectations;

Important Links

- Mosaic

- Avenue to Learn
- Student Accessibility Services - Accommodations
- McMaster University Library
- eReserves

McMaster University's writing support: https://studentsuccess.mcmaster.ca/writing-and-academic-skills/appointments/

Land Acknowledgement: We recognize and acknowledge that students of McMaster University meet and learn on the traditional territories of the Mississauga and Haudenosaunee nations and within the lands protected by the "Dish With One Spoon" wampum, an agreement to peaceably share and care for the resources around the Great Lakes.

Please find more information at the following links:

https://libguides.mcmaster.ca/welcome-to-mcmaster

https://indigservices.mcmaster.ca

Course Learning Outcomes

For accreditation reasons, these learning outcome statements must be tied back to CEAB graduate attributes (GAs), including those that are measured in this course. If you are unsure how to do this, please contact the Associate Chair Undergraduate in your department.

- Perform all the necessary calculations for each stage of the UTMS to estimate; trip generation, trip distribution, modal split, and route assignment [CEAB Indicators 4.4].

- Identify all four stages of the Urban Transportation Modelling System (UTMS) for traffic demand forecasting in the event of new development [CEAB Indicator 7.3].

- Assess the level of service of signalized intersections and determine optimal traffic signal timing plans through calculations [CEAB Indicator 3.2].

- Apply the fundamental principles of traffic flow theory and associated traffic engineering knowledge to solve unfamiliar problems, as well as the implementation of different traffic control strategies in transportation projects [CEAB Indicators 3.2 and 4.4].

- Perform all the necessary calculations for the geometric design of transportation facilities taking into consideration design, health and safety standards, and economic and environmental impacts [CEAB Indicator 4.4].

- Understand legal requirements governing transportation engineering practice and the role and responsibilities of transportation engineers in society [CEAB Indicator 7.1].

Course Learning Goals

- This course introduces the fundamentals of transportation systems, as well as the application of mathematical and engineering principles to address a wide array of transportation issues. The course introduces several major transportation aspects and is developed in five overarching themes. Theme one introduces the transportation engineering discipline and discusses the challenges and opportunities of contemporary transportation systems. Theme two focuses on travel behaviour and the four-step urban transportation demand model. Themes three and four detail the design and operation procedures, respectively, for transportation systems and focus on various topics that include; geometric cross-section, earthwork, traffic flow, and traffic controls. Lastly, the course concludes with remarks on “What constitutes a good transportation system?” from an engineering perspective, with emphasis on the evaluation of transportation projects as it relates to economic evaluation models and environmental impact assessments.

Required Materials and Texts

Textbook Listing: https://textbooks.mcmaster.ca

Canadian Capacity Guide for Signalized Intersections
Authors: Teply, S., Allingham, D.I., Richardson, D.B., Stephenson B.W.
Publication Date: 2008
Edition: 3rd
Available at: http://www.tac-atc.ca/sites/tac-atc.ca/files/site/doc/resources/report-capacityguide.pdf

Optional Course Materials

Textbook Listing: https://textbooks.mcmaster.ca

Introduction to Transportation Engineering
Authors: Banks, J.
Publisher: McGraw Hill, New York.
Publication Date: 2004
Edition: 2nd

Traffic Engineering
Authors: McShane, W.R., Prassas, E., and Roess, R.P.
Publisher: Prentice-Hall, New Jersey.
Publication Date: 2010
Edition: 4th

Class Format

In Person

This course will be offered in person. Please note that:

- Lecture notes will be available on A2L.
- Lectures will not be recorded.
- You are expected to take notes during class.

- Only a few items will be pre-recorded to save lecture time.

Course Evaluation

Exercises (1-10) 10 * 2.0% each	20%
Assignment 1	10%
Self-reflection written assignments 3 * 2% each	6%
Mid-term	10%
Term Project	20%
Final Exam	35%

Course Evaluation Details

Please note that students MUST score a passing grade (more than 50%) in the final exam to pass the course, and failing the final exam would result in failing the course.

Grading Scale

Grade	Equivalent Grade Point	Equivalent Percentages
A+	12	90-100
A	11	85-89
A-	10	80-84
B+	9	77-79
B	8	73-76
B-	7	70-72
C+	6	67-69
C	5	63-66
C-	4	60-62
D+	3	57-59
D	2	53-56
D-	1	50-52
F	0	0-49

Course Schedule

1. Transportation System; Issues & Challenges
2. Travel Behaviour, Data Collection, and Trip Generation
3. Trip Distribution & Mode Choice
4. Trip Assignment
5. Transportation Demand Project
6. Reading Week
7. Queuing Theory & Signalized Intersections
8. Signalized Intersection Design I
9. Signalized Intersection Design II
10. Signalized Intersection Design III
11. Geometric Cross-Section, Vertical and Horizontal Alignment
12. Economic Evaluation and Environmental Impact Assessment

Late Assignments

Late submissions will lose 5% of the assignment/exercise grade for every late business day.

Absences, Missed Work, Illness

Following the MSAF policy, the MSAF accommodation for this course will be to **reallocate the weight of missed items** at the discretion of the instructor and in consultation with the undergraduate advisor.

Turnitin.com

Some courses may use a web-based service (Turnitin.com) to reveal authenticity and ownership of student submitted work. For courses using such software, students will be expected to submit their work electronically either directly to Turnitin.com or via an online

learning platform (e.g. A2L, etc.) using plagiarism detection (a service supported by Turnitin.com) so it can be checked for academic dishonesty.

Students who do not wish their work to be submitted through the plagiarism detection software must inform the Instructor before the assignment is due. No penalty will be assigned to a student who does not submit work to the plagiarism detection software. All submitted work is subject to normal verification that standards of academic integrity have been upheld (e.g., on-line search, other software, etc.). For more details about McMaster's use of Turnitin.com please go to www.mcmaster.ca/academicintegrity.

Generative AI: Some Use Permitted

Students may use generative AI for editing/translating/outlining/brainstorming/revising/etc. their work throughout the course so long as the use of generative AI is referenced and/or acknowledged in their submitted work. Use of generative AI outside the stated use of [editing/translating/outlining/brainstorming/revising/etc.] without citation or acknowledgement will constitute academic dishonesty. It is the student's responsibility to be clear on the limitations for use and to be clear on the expectations for citation and reference, and to do so appropriately.

APPROVED ADVISORY STATEMENTS

Academic Integrity

You are expected to exhibit honesty and use ethical behaviour in all aspects of the learning process. Academic credentials you earn are rooted in principles of honesty and academic integrity. **It is your responsibility to understand what constitutes academic dishonesty.**

Academic dishonesty is to knowingly act or fail to act in a way that results or could result in unearned academic credit or advantage. This behaviour can result in serious consequences, e.g. the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: "Grade of F assigned for academic dishonesty"), and/or

suspension or expulsion from the university. For information on the various types of academic dishonesty please refer to the Academic Integrity Policy, located at https://secretariat.mcmaster.ca/university-policies-proceduresguidelines/

The following illustrates only three forms of academic dishonesty:

- plagiarism, e.g. the submission of work that is not one's own or for which other credit has been obtained.
- improper collaboration in group work.
- copying or using unauthorized aids in tests and examinations.

Authenticity / Plagiarism

Some courses may use a web-based service (Turnitin.com) to reveal authenticity and ownership of student submitted work. For courses using such software, students will be expected to submit their work electronically either directly to Turnitin.com or via an online learning platform (e.g. Avenue to Learn, etc.) using plagiarism detection (a service supported by Turnitin.com) so it can be checked for academic dishonesty.

Students who do not wish their work to be submitted through the plagiarism detection software must inform the Instructor before the assignment is due. No penalty will be assigned to a student who does not submit work to the plagiarism detection software. **All submitted work is subject to normal verification that standards of academic integrity have been upheld** (e.g., on-line search, other software, etc.). For more details about McMaster's use of Turnitin.com please go to www.mcmaster.ca/academicintegrity.

Courses with an On-line Element

Some courses may use on-line elements (e.g. e-mail, Avenue to Learn, LearnLink, web pages, capa, Moodle, ThinkingCap, etc.). Students should be aware that, when they access the electronic components of a course using these elements, private information such as first and last names, user names for the McMaster e-mail accounts, and program affiliation may become apparent to all other students in the same course. The available information is dependent on the technology used. Continuation in a course that

uses on-line elements will be deemed consent to this disclosure. If you have any questions or concerns about such disclosure please discuss this with the course instructor.

Online Proctoring

Some courses may use online proctoring software for tests and exams. This software may require students to turn on their video camera, present identification, monitor and record their computer activities, and/or lock/restrict their browser or other applications/software during tests or exams. This software may be required to be installed before the test/exam begins.

Conduct Expectations

As a McMaster student, you have the right to experience, and the responsibility to demonstrate, respectful and dignified interactions within all of our living, learning and working communities. These expectations are described in the Code of Student Rights & Responsibilities (the "Code"). All students share the responsibility of maintaining a positive environment for the academic and personal growth of all McMaster community members, **whether in person or online.**

It is essential that students be mindful of their interactions online, as the Code remains in effect in virtual learning environments. The Code applies to any interactions that adversely affect, disrupt, or interfere with reasonable participation in University activities. Student disruptions or behaviours that interfere with university functions on online platforms (e.g. use of Avenue 2 Learn, WebEx or Zoom for delivery), will be taken very seriously and will be investigated. Outcomes may include restriction or removal of the involved students' access to these platforms.

Academic Accommodation of Students with Disabilities

Students with disabilities who require academic accommodation must contact Student Accessibility Services (SAS) at 905-525-9140 ext. 28652 or sas@mcmaster.ca to make

arrangements with a Program Coordinator. For further information, consult McMaster University's Academic Accommodation of Students with Disabilities policy.

Academic Advising

For any academic inquires please reach out to the Office of the Associate Dean (Academic) in Engineering located in JHE-Hatch 301.

Details on academic supports and contact information are available from:

https://www.eng.mcmaster.ca/programs/academic-advising

Requests for Relief for Missed Academic Term Work

In the event of an absence for medical or other reasons, students should review and follow the Policy on Requests for Relief for Missed Academic Term Work.

Academic Accommodation for Religious, Indigenous, or Spiritual Observances (RISO)

Students requiring academic accommodation based on religious, indigenous or spiritual observances should follow the procedures set out in the RISO policy. Students should submit their request to their Faculty Office ***normally within 10 working days*** of the beginning of term in which they anticipate a need for accommodation or to the Registrar's Office prior to their examinations. Students should also contact their instructors as soon as possible to make alternative arrangements for classes, assignments, and tests.

Copyright and Recording

Students are advised that lectures, demonstrations, performances, and any other course material provided by an instructor include copyright protected works. The Copyright Act

and copyright law protect every original literary, dramatic, musical and artistic work, **including lectures** by University instructors.

The recording of lectures, tutorials, or other methods of instruction may occur during a course. Recording may be done by either the instructor for the purpose of authorized distribution, or by a student for the purpose of personal study. Students should be aware that their voice and/or image may be recorded by others during the class. Please speak with the instructor if this is a concern for you.

Extreme Circumstances

The University reserves the right to change the dates and deadlines for any or all courses in extreme circumstances (e.g., severe weather, labour disruptions, etc.). Changes will be communicated through regular McMaster communication channels, such as McMaster Daily News, Avenue to Learn and/or McMaster email.