

# CIVE 411 Transportation Engineering II

## Fall 2019 Syllabus

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**Instructor:**

Amy Kim, Ph.D., P.Eng.

**Contact information:**

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**Office Hours:**

Thursdays 9:30–11, OBA

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**Helpdesk:**

12:30-2 pm, Wednesdays &  
Thursdays, NREF 2-022

**Course Objectives**

1. Provide greater in-depth coverage of traffic operations and transportation planning concepts introduced in CIV E 315.
2. Provide opportunities for students to work with commercial software and other analysis/design methods used in the transportation engineering and planning practice.
3. Introduce major current issues and trends in urban transportation engineering and planning.

**Course Description**

Students are expected to acquire a more in-depth understanding of traffic operations and transportation planning concepts and methods. These include: Traffic flow fundamentals and characteristics; Operations of surface roadway networks and controls (intersections); Freeways and related facilities; Capacity analysis of various transportation facilities; Travel demand analysis; data collection methods.

**Lectures**

Tuesdays and Thursdays 8–9:20 am, **NREF 1-001** (see Course Schedule on last page for details).

**Reference Materials**

1. [HCM] Highway Capacity Manual 2016.  
At: U of A Libraries, through Knovel. Search “Highway Capacity Manual” and click the 5<sup>th</sup> result of the search. It should be listed as: **5. Highway capacity manual: a guide for multimodal mobility analysis, 6th edition.**
2. [CCGSI] Canadian Capacity Guide for Signalized Intersections, 3rd Edition.  
<http://tac-atc.ca/sites/tac-atc.ca/files/site/doc/resources/report-capacityguide.pdf>
3. [GH] Traffic and Highway Engineering by Garber, N.J. and Hoel, L.A. 4<sup>th</sup> Edition, Cengage Learning.
4. [MKW] Principles of Highway Engineering and Traffic Analysis by Mannering, Kilareski, and Washburn. 4<sup>th</sup> Edition, Wiley.

References 1 & 2 are required (and free online); 3 & 4 are optional although I do reference 3 (Garber & Hoel) often as it used to be required reading. The topics we cover in this class are available in many textbooks and online; let me know if you would like some suggestions or have found a great reference

somewhere. Readings from other sources may be given throughout the term. References 1, 3, and 4 are also on reserve at Cameron Library.

### **Class Materials and Communication**

- All assignments, lecture materials, labs, supplemental references, etc. will be posted on eClass.
- Announcements will be made via email (I don't use the Announcements function in eClass as there is sometimes a delay in sending out email notifications).

### **Grading**

Assignments	15%	Midterm exam	25%	Attendance/participation	5%
Labs	10%	Final exam	45%		

### **Exams**

- **Midterm Exam** is scheduled for Tuesday October 29, 8–9:20 AM. Materials you are allowed to bring in are: 1) **single sided**, 8.5"x11" cheat sheet, and 2) non-programmable calculator (not on phones).
- **Final Exam** will be held during the exam period, date TBA. Materials you are allowed to bring in are: 1) **double sided**, 8.5"x11" cheat sheet, and 2) non-programmable calculator (not on phones).

### **Homework Policy**

Assignments are to be submitted **in the designated class box** (NREF 2<sup>nd</sup> floor) on the date and time indicated. Always remember to include your name and ID! Late submissions will be penalized 25% per business day.

### **Labs**

- Lab sessions will be on Thursdays 5–8 pm, **NREF 2-118** on the **5** dates shown in the Course Schedule.
- There are 5 lab sessions in total. Lab 1 will require *supplemental field work* in groups, which will be described in the lab session. Completed labs must be submitted on the date and time indicated on the handout, in the designated class box. Late submissions will be penalized in the same manner as assignments (25% per business day).
- Faculty of Engineering Statement on Safety During Learning Activities (standard text):  
*In all Faculty of Engineering courses, labs, seminars or other learning activities, safety is of paramount importance. In some cases, laboratory work in a program requires high standards for risk management to keep potential hazards safely under control. Anyone found to be unable to function safely, due to intoxication, behaviour, or other reasons, in the class, lab, seminar or other learning activity may be asked to leave or be removed for their and the safety of other participants and instructors. As members, or prospective members, of the engineering profession, it is your responsibility to identify and inform the proper authorities of an unsafe work/learning environment.*

## Communications

I will respond to emails within 1-2 business days; include “CIVE 411” in your subject line to ensure I don't miss it. Please also drop in during office hours for help with the course materials, or whatever questions you have about transportation engineering and planning (including careers, graduate programs, etc.). Outside my office hours, please make an appointment.

Here are some examples of unprofessional communications you may want to consider:

- Not addressing the recipient correctly, or not addressing them at all.
- Not signing your name.
- Being overly informal or colloquial – you're not writing a friend.
- Attaching a photo of your work and asking recipient to find the problem. In general, long questions that have complex answers are probably not suitable for email – please come see me (or a TA) in person.

## Academic Integrity (standard text)

Policy about course outlines can be found in Course Requirements, Evaluation Procedures and Grading of the University Calendar.

The University of Alberta is committed to the highest standards of academic integrity and honesty. Students are expected to be familiar with these standards regarding academic honesty and to uphold the policies of the University in this respect. Students are particularly urged to familiarize themselves with the provisions of the Code of Student Behaviour (online at [www.governance.ualberta.ca](http://www.governance.ualberta.ca)) and avoid any behaviour which could potentially result in suspicions of cheating, plagiarism, misrepresentation of facts and/or participation in an offence. Academic dishonesty is a serious offence and can result in suspension or expulsion from the University.

Audio or video recording, digital or otherwise, of lectures, labs, seminars or any other teaching environment by students is allowed only with the prior written consent of the instructor or as a part of an approved accommodation plan. Student or instructor content, digital or otherwise, created and/or used within the context of the course is to be used solely for personal study, and is not to be used or distributed for any other purpose without prior written consent from the content author(s).

Only those items specifically authorized by the instructor may be brought into the exam facility. The use of unauthorized personal listening, communication, recording, photographic and/or computational devices is strictly prohibited. Students should refrain from bringing any unauthorized electronic device into an examination room, including cell phones, high tech watches, high tech glasses or other such devices.

## Support Services and Safety

There are various low to no-cost services on campus to help students succeed. For information about academic, wellness, and various other support services available to students, see <http://www.deanofstudents.ualberta.ca/>. The Faculty of Engineering also has various health and well-being initiatives throughout the term.

U of A Safety Basics: <https://www.ualberta.ca/protective-services/information-safety/basics-for-students>

1) It's never too early or too late to seek help! 2) You should always feel safe on campus, and in this class.

## Fall 2019 Course Schedule (may be subject to change)

Week	Date	Topic	Readings <sup>1</sup>	Labs & Assignments <sup>2</sup>
1	09/03	Course introduction & overview		
	09/05	Introduction to urban transport engineering & planning	[GH] 11	
2	09/10	Traffic flow fundamentals	[GH] 6.1-2	
	09/12	Shockwaves	[GH] 6.3, 6.5	
3	09/17	Shockwaves	""	<i>Assignment 1 due</i>
	09/19	Shockwaves	""	Saturation Flow (1)
4	09/24	Quality, LOS, and capacity concepts	<b>[HCM] 5, [CCGSI] 3.1-2, 5.2-3</b>	
	09/26	Capacity and LOS concepts	[GH] 9, [HCM] TBA	
5	10/01	Capacity and LOS concepts	<b>[HCM] TBA</b>	<i>Assignment 2 due (10/2)</i>
	10/03	Interrupted flow facilities & gaps	[GH] 6.4	Highway Capacity Analysis (2)
6	10/08	Signalized intersections	[GH] 7.1, 8.1-3	
	10/10	Signalized intersection analysis	[GH] 8.3.5, 8.4, 10.2, <b>[CCGSI] 3.3, 4.1-8</b>	
7	10/15	Signalized intersection analysis/control	[GH] 8.4, <b>[CCGSI] 3.3, 4.1-8</b>	<i>Assignment 3 due (10/16)</i>
	10/17	Signalized intersection control	<b>[CCGSI] 3.3, 4.1-7</b>	Signal Design, Synchro (3)
8	10/22	Signalized intersection control	<b>[CCGSI] 3.3, 4.1-7</b>	
	10/24	Midterm review / catch up		
9	10/29	<b>MIDTERM EXAM</b>		
	10/31	Urban transportation planning issues	[GH] 11, TBA	
10	11/05	Cycling network analysis & traveller characteristics (guest lecture)	<i>Guest: Laura Cabral, MSc, Tool Design</i>	<i>Assignment 4 due (11/06)</i>
	11/07	Complete Streets (half guest lecture)	<i>Guest: Anika Muhammad, City of Edmonton</i>	Complete Streets (4)
11	11/12	<i>Reading week!</i>		
	11/14			
12	11/19	Travel demand analysis; 4-step model: Trip Generation (1/4)	[GH] 12.1-2	
	11/21	4-step model: Trip Distribution (2/4)	[GH] 12.3	<i>Assignment 5 due</i>
13	11/26	4-step model: Mode Choice (3/4)	[GH] 12.4	
	11/28	4-step model: Traffic Assignment (4/4)	[GH] 12.5	Model Estimation; Urban Network Planning (5)
14	12/03	Urban network planning considerations (short guest lecture)	<i>Guest: Emily Grise, UofA Urban Planning</i>	
	12/05	Review		<i>Assignment 6 due</i>

- 1 Readings in **bold** are **required**. Other readings are optional. Any additional readings will be identified in lectures.
- 2 Assignment due dates may be subject to change; please always refer to due dates listed on each assignment, and announcements in class and email.