

**CME 302 – Introduction to Transportation Engineering
Spring 2014**

Time and Day: 5:00-6:15pm TR **Classroom:** 1033 ERF

Instructor: Professor B. Zou, ERF 2073; bzou@uic.edu; Tel: 996-3404

Ohs: W 3:00-5pm, or by appointment, email, or walk-in

Teaching Assistants: Nabin Kafle, nkafle89@gmail.com, Ohs: T 2-4pm, 2077 ERF

Textbook: Mannering and Washburn, *Principles of Highway Engineering and Traffic Analysis, 5th Edition*, Wiley, 2013, Chapters 5-8

Reference book: Highway Capacity Manual 2010

Prerequisites by topic: basic computer skills, familiar with EXCEL spreadsheet.

Objectives:

1. Provide a broad overview of the role of transportation in the economy and in society;
2. Introduce highway traffic theories and transportation planning principles for solving transportation problems;
3. Introduce traffic engineering approaches to highway capacity and level of service analysis.

What will students gain from this class?

1. Gain an understanding of the contributions of engineering, and especially civil engineering, to transportation systems;
2. Become familiar in the terminology and principles of the transportation field;
3. Become familiar with basic computer tools used in transportation analysis;
4. Able to apply what you have learned from the class to solving real-life problems.

Topics: Fundamentals of traffic engineering, operation and transportation demand and planning.

1. System Issues and Challenges
2. Traffic theories
 - Traffic Flow Basics (Ch 5)
 - Traffic Queueing Basics (Ch 5)
3. Traffic engineering
 - Capacity and Level of Service (Ch 6)
 - Intersection Analysis (Ch 7)
4. Transportation planning
 - Demand Analysis (Ch 8)
5. Air Transportation

Blackboard website: a Blackboard website (<https://blackboard.uic.edu/>) has been set up for the course. To log in, use your UIC netid and password. Lecture notes and other class materials will be available on the website:

- Syllabus
- Lecture slides
- Homework assignments and solutions
- Lab exercises and solutions
- Quizzes and solutions
- Grades
- Announcements, etc.

Course Points: a total of 100 points - homework (10%), quizzes (10%), computer labs (10%), term project (15%), midterm examination (20%), and final examination (30%), attendance (5%)

Homework (10%): a total of seven assignments. Due dates will be posted when HW is assigned. *No late submission is allowed.* Solutions will be posted on Blackboard after the homework has been handed in.

Quiz (10%): a total of five quizzes – please check the course timeline on page 3 for the schedules of quizzes. Quiz takes place in the last 10 minutes of the class. Usually there is one or two questions on material from the previous lecture.

Group project (15%): TBA. Will be assigned in week 6. The class will be divided into groups – number of teammates to be determined. Please form your own group by the end of week 6. The final products include a term project report due on Monday, December 2nd and term project presentations by each group in week 15.

Lab session (10%): a total of four labs scheduled at the CME computer lab (1264 SEL) using the highway capacity and traffic analysis software (HCS2000). A lab report after each lab is mandated. The format of the lab report will be explained during the lab. The lab report is due on **Friday** of the same week.

Examinations: one mid-term exam (20%) in week 9 and one final exam (30%), time TBA. There will be an in-class mid-term and a final review before the exams.

Attendance (5%): class attendance is required. There will be sign-in sheet handed out during the class for randomly selected lectures.

Wk	Date	Topic	Assignment
1	1/21	Introduction, system issues and challenges	
2	1/23	Traffic stream parameters (Ch 5.1-5.3)	HW#1
	1/28	Basic traffic stream models (Ch 5.3),	
3	1/30	Poisson distribution/Model (Ch 5.4)	
		Quiz #1: traffic stream parameters+models	
	2/4	Traffic Queueing I (Ch 5.5)	HW#2
4	2/6	Traffic Queueing II (Ch 5.5)	
	2/11	Introduction to HCM and LOS (Ch 6.1-6.3)	
		Quiz #2: Queueing model	
5	2/13	Basic Freeway Segment LOS (Ch 6.4),	HW#3
	2/18	Term project discussion	Term project
6	2/20	<u>Computer lab I:</u> HCS2010 (Freeway LOS)	Lab report 1
	2/25	Multilane and Two-lane Highway LOS I (Ch 6.5-6.7)	HW#4
7	2/27	Multilane and Two-lane Highway LOS II (Ch 6.5-6.7)	
	3/4	<u>Computer lab II:</u> HCS2010 (Multilane and Two-lane Hwy)	Lab report 2
8	3/6	Review for midterm exam	
	3/11	Midterm	
9	3/13	Intersection LOS I (Ch 7.1-7.3)	HW#5
		Quiz #3: Freeway, multi- and two-lane highway LOS	
	3/18	Intersection LOS II (Ch 7.4-7.6)	
10	3/20	<u>Computer lab III:</u> HCS2010 (Intersection LOS analysis)	Lab report 3
	4/1	Signal Design and Coordination (Ch 7.7-7.8)	HW #6
		Quiz #4: intersection LOS	
11	4/3	<u>Computer lab IV:</u> HCS2010 (Signal design)	Lab report 4
	4/8	Demand Analysis I (Ch 8)	
12	4/10	Demand Analysis II (Ch 8)	HW#7
	4/15	Demand Analysis III (Ch 8)	
13	4/17	Application to non-highway transportation modes I	
	4/22	Review for Final Exam	
		Quiz #5: Demand Analysis	
14	4/24	Term project presentations	
	4/29	Term project presentations	
15	5/1	Term project presentations	Term project report due
16	TBD	Final exam	