

COURSE OUTLINE
 CEE 416 - TRAFFIC CAPACITY ANALYSIS
 FALL 2023 (8/14/2023)
 Department of Civil and Environmental Engineering
 University of Illinois at Urbana-Champaign

TOPIC	REFERENCE	DATE
1. Introduction	Review Material NS	8/21*
2. Review of Driver-Vehicle-Roadway Characteristics 1 - Driver and Pedestrian Characteristics 2 - Vehicle Characteristics 3 - Roadway Characteristics	Review Material NS	8/23, 8/25
3. Traffic Stream Characteristics 1 - Volume and Flow Rate 2 - Speed Characteristics 3 - Density and Occupancy	Traffic Flow NS	8/28-9/1
4. Introduction to Traffic Flow Models 1 - Speed-Density-Volume Models 2 - Microscopic Approach 3 - Macroscopic Approach 4 - Shockwaves	Traffic Flow & Shockwave NS	9/6-9/20
5. Field Measurement 1 - Saturation flow rate 2 - Delay	HCM 2016 Append.	9/22
Project Description and Field Data Collection	Project Handout	9/25-9/27
EXAM 1,		Friday Oct 6
6. Intersection Design and Operation 1 - Intersection Control 2 - Signal Warrants 3 - Signal Timing and Phasing	Signal Timing NS & HCM Ch 19	9/29-10/18
7. Intersection Capacity and LOS 1 - Signalized Intersections 2 - Unsignalized Intersections and Roundabouts	Capacity Analysis NS & HCM Ch 19	10/20- 11/3
Project Discussion	Project Handout	11/6
8. Arterial Traffic Control 1 - Introduction to Signal Coordination	Signal Coordination NS	11/8

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| 9. | Highway Capacity and Level of Service
1 - Freeway Segments
2 - Weaving Area
3- Ramps Area | Capacity Analysis
for Freeways NS | 11/13-12/6 |
| 10. | Traffic Impact Study (CLASS PROJECT) | Project Handout | |

*The scheduled topics are tentative and may shift by one or two days.

Grading and Due Dates

Exam 1	20%	Fri Oct 7
Exam 2	20%	Fri Nov 11
Class Project	25%	Due to 5 pm on Wed, Dec. 6
Final	25%	Dec 11, 8-11 am
Homework & quiz	10%	HW due at the beginning of class For late HW, 25% penalty/day

Graduate students taking this course for 4 credit hours must write a term paper in addition to the work required from the students taking this course for 3 credit hours. The topic of the term paper will be decided later. The term paper is due at 5 pm on the last day of this class. The graduate students' final grade will be based on weighted average of the one-hour term paper and the three-hour class work.

Texts:

Required:

1. Notebook and Slides (NS) for CEE 416 (available on Canvas)
2. Project Handout (will be distributed later)

Recommended:

1. Traffic Engineering, 5th Edition, by R. Roess, E.S. Prassas, and W. R. McShane, Prentice Hall, 2019
2. Highway Capacity Manual (HCM) 2016 or 2021, TRB
3. Traffic and Highway Engineering, 5th Edition, N.J. Garber, L.A. Hoel, Cengage Learning, 2015

Instructor: Rahim F. "Ray" Benekohal, Ph.D.
Professor of Civil and Environmental Engineering
1213 Newmark Civil Engineering Lab
Email: rbenekoh@illinois.edu
Office Hours: M, W, F 10-11am or by appointment

Teaching Assistant (TA)

No TA for this course,
Hong Jae Jeon hjeon17@illinois.edu will help with the lab