

## TRSS 414: Traffic Engineering

Fall 2014, MW 2:00 PM – 3:20PM, CBEIS 251

---

<b>Instructor</b>	<b>Dr. Celeste Chavis</b>	<b>Office Hours</b>	Monday: 1:00-2:00, 3:30-4:30
Office	CBEIS – Room 241		Tuesday: 2:30-4:30
Phone	443-885-5061		Wednesday: 1:00-2:00,3:30-4:30
Email	<a href="mailto:celeste.chavis@morgan.edu">celeste.chavis@morgan.edu</a>		Thursday: 2:30-4:30

---

### Course Description

This course presents general background and context of traffic engineering as a profession, introduces basic principles, processes, and methodologies that are fundamental in traffic engineering, and show concepts, methods, and tools that are necessary in transportation system operation, analysis, and control.

### Course Objectives

At the conclusion of this course, students should be able to: define the profession and the functional areas of traffic engineering, understand the role of a traffic engineer, understand fundamental principles of traffic flow, collect and present traffic data in an acceptable format, describe how the various types of intersections work, understand highway capacity analysis procedures, and its application in analyzing traffic operations.

### Learning Outcomes

- Familiarity with challenges facing transportation professionals and engage in life-long learning
- Ability to apply mathematics, science, applied science, technological tools, and principles of engineering, planning and management to solve transportation-related problems
- Ability to communicate effectively and function on multi-disciplinary teams
- Ability to design and conduct experiments as well as to analyze and interpret data

### Teaching Method

This course involves mostly lectures, class discussion, field exercises and some computer applications.

### Course Requirements and Student Evaluation

Successful completion of the class will depend on regular class attendance, timely completion of homework and projects, in-class participation, and exams.

- |                |     |                              |     |
|----------------|-----|------------------------------|-----|
| • Midterm Exam | 20% | • Labs                       | 25% |
| • Final Exam   | 25% | • <b>Class participation</b> | 10% |
| • Assignments  | 20% | • <b>and attendance</b>      |     |

We will be using the Top Hat Monocle classroom response system. For those of you with smart phones an app can be downloaded. At the beginning of class, a quiz will be displayed to students to test comprehension of the previous lectures, assigned readings, spur discussion and take attendance.

The grade distribution is as follows:

- A 90 – 100%
- B 75 – 89%
- C 65 – 74%
- F Below 65%

### **Academic Honesty**

Students *currently* taking this class can work together to conceptualize general approaches to assignments. However, unless otherwise specified for a particular assignment, the work you submit should be done completely on your own. This includes text, numerical calculations, mathematical derivations, diagrams, graphs, computer programs and output.

Plagiarism, according to the policy of Morgan State University, is not tolerated and students will be disciplined. The exact words or approximate words, or ideas of another person must be quoted and attributed. Students who fail to observe this rule will receive an “F” for the course.

### **Courtesy**

Please silence cell phones and restrict use during class. Computers are available as a class aide and thus use outside of class related activities should be kept to a minimal.

### **Accommodations**

Please seek the instructor immediately if special accommodations are necessary. These include but are not limited to disabilities and personal emergencies.

### **Suggested Reference Material**

1. **Garber, N. J. and L. A. Hoel. *Traffic and Highway Engineering (Fourth Edition)*. Brookes/Cole Publisher, 2009.**  
We will focus on Part II of the text. Part IV and V are covered in TRSS 415.
2. Mannering, F.L., Kilareski, W.P., and S.S. Washburn. *Principles of Highway Engineering and Traffic Analysis* (Third Edition). John Wiley and Sons, Inc., 2005.
3. *Highway Capacity Manual (HCM 2010)*, Transportation Research Board, Washington DC, 2010, [hcm.trb.org](http://hcm.trb.org).
4. *Manual on Uniform Traffic Control Devices (MUTCD 2009)*, Federal Highway Administration, US Department of Transportation, Washington DC.  
[http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/pdf\\_index.htm](http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/pdf_index.htm)

## Course Schedule

Week	Date	Topics	Readings
1	8/25 8/27	Introduction Excel Tutorial	
2	9/1 9/3	<b>Labor Day – No Classes</b> Driver, Pedestrian, Vehicle and Road Characteristics	Ch. 3
3	9/8 9/10	Driver, Pedestrian, Vehicle and Road Characteristics, cont. Traffic Engineering Studies	Ch. 3 Ch. 4
4	9/15 9/17	Traffic Engineering Studies, cont. Intersection Control: General Concepts, Conflict Points, Types	Ch. 4 Ch. 8, p., 327-342
5	9/22 9/24	<b>Lab 1</b> – Turn Movement Counts & Conflict Points Traffic Theory: Links	Ch. 6
6	9/29 10/1	Traffic Theory: Links Traffic Theory: Links	Ch. 6
7	10/6 10/8	Capacity and LOS – Uninterrupted Flows Review	Ch. 9
8	10/13 10/15	<b>Midterm</b> Capacity and LOS – Uninterrupted Flows (cont)	Ch. 9
9	10/20 10/22	Highway Safety & Crashes, Walking Audits <b>Lab 2</b> – Walking Audit	Ch. 5
10	10/27 10/29	<i>Guest Speaker</i> Queuing	Ch. 6
11	11/3 11/5	Queuing, cont. Traffic Flow Theory Recap	Ch. 6
12	11/10 11/12	Intersection Control	Ch. 8
13	11/17 11/19	Capacity and Level of Service: Interrupted Flow	Ch. 10
14	11/24 11/26	<b>Lab 3</b> – Level of Service and Highway Capacity Software	
15	12/1 12/3	Catch up/Lab Time Final Review	
16	12/8- 12/10	<b>Final Exam</b>	