Preliminaries

Classes:
- Lecture: M and W
  11:15am – 12:05pm  CivE 210
- Recitation/Lab:
  W  1:25 - 2:15
  F  2:30pm – 3:20pm  CivE 221
- Instructor:  Dr. David Levinson
dlevinson@umn.edu
- Office:  GivE 138
  Phone: 625-6354 (emergencies only)
- Office Hours: M and W  1:05pm – 2:00pm
  or by appointment

Teaching Assistants

Tyler
Patterson

Shanjiang
Zhu

Syllabus and Website

I will post the course syllabus, lecture notes, homework problems and labs on the class website:
- http://nexus.umn.edu/Courses/ce3201/index.html

You will post homework solutions to WebVista.

Grading

MAX (Σ (3 Midterm exams (20% each)), 1 Final exam (60%))
Homework (20% total)
Lab (20% total)
Poll: How many of you are concentrating in:

<table>
<thead>
<tr>
<th>Option</th>
<th>Count</th>
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<tbody>
<tr>
<td>A. Transportation Engineering</td>
<td>5</td>
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<tr>
<td>B. Environmental Engineering</td>
<td>5</td>
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<tr>
<td>C. Structural Engineering</td>
<td>26</td>
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<tr>
<td>D. Water Resources Engineering</td>
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<tr>
<td>E. Geomechanical Engineering</td>
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<tr>
<td>F. Interdisciplinary (Civil)</td>
<td>5</td>
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<tr>
<td>G. Undecided (Civil)</td>
<td>12</td>
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<tr>
<td>H. Other</td>
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Transportation Students

“Wet” Students

“Dry” Students

You seldom hear complaints about water quality ...
or structures falling down

Why do transportation systems engender such complaints, why do they fail on a daily basis?

Are transportation engineers just incompetent?
Or is something more fundamental going on?

By understanding the systems as citizens, you can work toward their improvement.

http://www.dot.state.mn.us/i35wbridge/video/collapse2mins.wmv
Or at least you can entertain your friends at parties.

One Goal of Transportation Engineering is The Safe and Efficient Movement of People and Goods.

What about 20?
But Goal (safe and efficient movement of people and goods) doesn’t answer:

Who, What, Where, When, How, Why

The course is broken into 3 major units:
- Transportation Planning: Forecasting, determining needs and standards.

Overview

Planning

Operation – Traffic Flow Theory

Traffic Signal Control

Controller Cabinet
No late homework is allowed.

The lab sections will be used to provide experience with computer applications to understand the types of problems which will be encountered in the real world.

A cooperative, group-centered format will be employed in the labs. A team-centered format will be employed, where student teams complete and turn in an assigned exercise.

What is the Transportation Problem?

[Work in pairs, come up with list, round robin]

What keeps us from accomplishing goals?

If you are concerned about your background and timely preparation for this course, please speak to the instructor.

The specific background topics that will be applied in this class comprise college mathematics and physics including calculus, linear algebra, and mechanics.

Familiarity with computer spreadsheets and the use of common computer applications (a word processor, a browser) is assumed.

1. Read assigned chapters of textbook before next class.

2. Bring calculator and writing implement, you will be doing problems in class. (textbook optional)

3. No lab today or Friday. See you Monday September 10.
Modalism and Intermodalism

Transportation is often divided into infrastructure modes: e.g. highway, rail, water, pipeline and air. These can be further divided: Highways include different vehicle types: cars, buses, trucks, motorcycles, bicycles, and pedestrians. Transportation can be further separated into freight and passenger, and urban and inter-city. Passenger transportation is divided in public (or mass) transit (bus, rail, commercial air) and private transportation (car, taxi, general aviation).

These modes of course intersect and interconnect. All-grade crossings of railroads and highways, inter-modal transfer facilities (ports, airports, terminals, stations).

Different combinations of modes are often used on the same trip. I may walk to my car, drive to a parking lot, walk to a shuttle bus, ride the shuttle bus to a stop near my building, and walk into the building.

Transportation is usually considered to be between buildings (or from one address to another), although many of the same concepts apply within buildings. The operations of an elevator and bus have a lot in common, as do a forklift in warehouse and a crane at a port.

Homework and Reading

Homework:
Identify a transportation problem in the city, county, state or nation-wide from all sources. Think about the solutions. Write a short paragraph to describe the problem and your solution.
Due: Monday, 09/10/07
Reading Assignment:
Textbook Chapter 1

Abbreviations

• LOS - Level of Service
• ITE - Institute of Transportation Engineers
• TRB - Transportation Research Board
• ITSO - Interdisciplinary Transportation Student Organization
• TLA - Three letter abbreviation

Key Terms

• Hierarchy of Roads
• Functional Classification
• Modes
• Vehicles
• Freight, Passenger
• Urban, Intercity
• Public, Private

Transportation Economics

Transportation is not free, it costs both time and money. These costs are represented by a supply curve, which rises with the amount of travel demanded. Similarly, demand (the number of vehicles which want to use the facility) depends on the price, the lower the price, the higher the demand. These two curves intersect at an equilibrium point. In the example at ($0.50/km, and 3000 vehicles per hour). Time is usually converted to money (using a Value of Time), to simplify the analysis.
Who Provides Transportation

- Transportation services are provided by both the public and private sector.
- Roads are generally publicly owned in the United States, although this has not always been true; our country has a long history of privately owned turnpikes through the early 1900s.
- Railroads are generally private.
- Carriers (Airlines, Bus Companies, Truckers, Train Operators) are often private firms.
- Formerly private urban transit operators have been taken over by local government from the 1950s.