Instructor: Dr. Randy Machemehl
Office: ECJ 7.202
Phone: 471-4541
E-mail: rbm@mail.utexas.edu
Office Hours: MW, 2:00 - 3:00 p.m., other times by appointment
Lecture: TTH, 12:30 - 2:00 p.m., ECJ 7.202
Grader: You may ask grading questions by submitting them as homework problems or talking directly to the instructor who will be doing the grading.

Required Textbook: None.
Class Notes Optional (Available at Speedway Printing)
Notes available at http://courses.utexas.edu

Prerequisites for CE 392M:
Graduate Students: Graduate standing and consent of Instructor
Undergraduate Students: Credit for CE 321 or the equivalent.

Homework:

Homework problems are normally due the next class meeting after assigned. All problems must be handed in at the beginning of the period in which they are due. After this time, they are considered late and no credit will be given; however, all assigned problems must be handed in before the final exam or the instructor will consider the student's work incomplete and will award grades accordingly. You may ask questions of the grader by writing concise notes to him/ her and submitting them as homework problems.

Attendance:

Attendance is required. A sign up sheet will be passed around each class period.
Testing and Examination Policy:

Make-up exams will NOT generally be given. If a student is absent from a scheduled exam due to medical or other problems beyond his/her control, the instructor may increase the grade percentage for the other exams, thus avoiding a grade of zero for a scheduled exam. The exam schedule is as follows:

<table>
<thead>
<tr>
<th>Exam</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exam I</td>
<td>Thursday,</td>
</tr>
<tr>
<td></td>
<td>February 28,</td>
</tr>
<tr>
<td></td>
<td>2002</td>
</tr>
<tr>
<td>Exam II</td>
<td>Thursday,</td>
</tr>
<tr>
<td></td>
<td>April 18,</td>
</tr>
<tr>
<td></td>
<td>2002</td>
</tr>
<tr>
<td>FINAL EXAM</td>
<td>Monday, 9:00a-12:00p</td>
</tr>
</tbody>
</table>

Grading Policy:

Grades will be based on the following:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hour Exam 1 (Thursday, 02/28/02)</td>
<td>20</td>
</tr>
<tr>
<td>Hour Exam 2 (Thursday, 04/18/02)</td>
<td>20</td>
</tr>
<tr>
<td>Homework Assignments (6-10)</td>
<td>10</td>
</tr>
<tr>
<td>Final Exam (Monday, May 13, 2002, 9:00 a.m.-12:00 noon)</td>
<td>30</td>
</tr>
<tr>
<td>Project: Written</td>
<td>15</td>
</tr>
<tr>
<td>Project: Oral</td>
<td>5</td>
</tr>
<tr>
<td>Total Points</td>
<td>100</td>
</tr>
</tbody>
</table>

Schedule of Milestone for Project

- January 24, 2002: Topics Chosen
- February 28, 2002: Outline Due
- April 25, 2002: Written Version Due
- April 30 & May 2, 2002: Oral Presentations
Course Instructor Evaluation Plan:

The College of Engineering Course-Instructor Survey will be used as the basic evaluation tool. All students are encouraged to submit written comments during this survey.

Important Dates:

<table>
<thead>
<tr>
<th>Date</th>
<th>Day</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 14, 2002</td>
<td>Monday</td>
<td>Classes begin.</td>
</tr>
<tr>
<td>January 30, 2002</td>
<td>Wednesday</td>
<td>Twelfth class. Last day to drop a course for a possible refund.</td>
</tr>
<tr>
<td>February 11, 2002</td>
<td>Monday</td>
<td>Last day to drop a course without a possible academic penalty.</td>
</tr>
<tr>
<td>March 11-16, 2002</td>
<td>Mon-Fri</td>
<td>Spring break.</td>
</tr>
<tr>
<td>March 25, 2002</td>
<td>Monday</td>
<td>Last day an undergraduate student may, with the dean's approval, withdraw from the University or drop a course except for urgent and substantiated, nonacademic reasons.</td>
</tr>
<tr>
<td>May 3, 2002</td>
<td>Friday</td>
<td>Last class day.</td>
</tr>
<tr>
<td>May 13, 2002</td>
<td>Monday</td>
<td>CE 392M Final Exam, 9:00 a.m.-12:00 noon</td>
</tr>
</tbody>
</table>

NOTE:

A course/instructor survey will be handed out for completion on the last day of class. You must attend class to pass. Graduate standing is required in order to take this class.

"The University of Texas at Austin provides, upon request, appropriate academic adjustments for qualified students with disabilities. Any student with a documented disability (physical or cognitive) who requires academic accommodations should contact the Services for Students with Disabilities area of the Office of the Dean of Students at 471-6259 as soon as possible to request an official letter outlining authorized accommodations. For more information, contact that Office, or TDD at 471-4641, or the College of Engineering Director of Students with Disabilities at 471-4321."

"Web-based, password-protected class sites will be associated with all academic courses taught at The University. Syllabi, handouts, assignments and other
resources are types of information that may be available within these sites. Site activities could include exchanging email, engaging in class discussions and chats, and exchanging files. In addition, electronic class rosters will be a component of the sites. Students who do not want their names included in these electronic class rosters must restrict their directory information in the Office of the Registrar, Main Building, Room 1.” For information on restricting directory information see page 7 or go to: http://www.utexas.edu/student/registrar/catalogs/gi00-01/app/appc09.html

**College of Engineering Drop Policy:**

**Undergraduate Students:** From the 1\textsuperscript{st} through the 4\textsuperscript{th} class day, an undergraduate student can drop or add a course on ROSE or TEX. From the 5\textsuperscript{th} through the 12\textsuperscript{th} class day, a student can drop through ROSE or TEX; adds must be done in the department offering the course. For any drops beginning with the 13\textsuperscript{th} class day, a student must initiate the drop process in the office of the Dean (ECJ 2.200). Departmental advisor and instructor approval may be required.

**Graduate Students:** From the 1\textsuperscript{st} through the 4\textsuperscript{th} class day, graduate students can drop a course on Rose or TEX. Beginning with the 5\textsuperscript{th} class day, graduate students must initiate any adds or drops in their department. Graduate students can drop or add a class until the last class day with permission from the departmental Graduate Advisor and the Dean. Students with a 20 hr/week GRA/TA appointment or a fellowship may not drop below 9 hours in a long session.

**University Scholastic Dishonesty Policy:**

Students who violate University rules on scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and/or dismissal from the University. Since such dishonesty harms the individual, all students, and the integrity of the University, policies on scholastic dishonesty will be strictly enforced. For further information, visit the Student Judicial Services web site http://www.utexas.edu/depts/dos/sjs/.
Topical Course Outline

Section 1 - Introduction, Demand Estimation, and Statistical Tools
  Industry Characterization
  Operational Problems
  Federal Legislation Regarding Public Mass Transportation
  Characterization of Transit Modes
  Sketch Planning Models
  Statistical Tools
  Hypothesis Testing
  Correlation, Parametric and Non-Parametric
  Regression
  Sampling from Semi-Infinite and Finite Populations

Section 2 - Conceptual Framework for Estimating Transit Demand
  Latent Corridor Demand
  Transit Demand Versus Auto System Congestion
  Personal Choice of Travel Modes
  Corridor Analysis
  Walking Distances and Coverage Areas
  Estimating Design Capacities for Transit Systems

Section 3 - Route Design
  Routing Considerations, Pattern Types
  Terminal or Stop Spacing
    Operator Versus User Cost
    User Access Versus On-Board Time
  Model Development

Section 4 - Basic Vehicle Scheduling Relationships
  Vehicle Capacity
  Route Capacity
  Vehicle Requirements Versus Passenger Demand
  Cycle Time
  Modeling of Passenger Boarding and Deboarding Times
    Poisson Processes
    Probabilities and Combinations

Section 5 - Driver Scheduling
  Demand Estimates Per Analysis Period
  Labor Contract Constraints
  Vehicle Schedule
  Driver Schedule
Section 6 - Networks
   Concepts
   City Forms
   Network Types
   Progression of Networks and Modes
   Network Evaluation

Section 7 - Rail Transit Summary
   Selection Considerations
   Capacity Comparisons, Local Bus, HOV Lanes, Light and Rapid Rail
   Cost Comparisons
   Design
      Guideway
      Stations
      Vehicles
      Capacity Calculations
   Rail Transit Ways
      Geometrics
      Clearances
      Track Gauge
      Track Superstructure
   Terminal Design Concepts
   Light Rail Transit Operations
      Right of Way
      Street Intersection

Section 8 - Propulsion Systems
   Vehicle Motion
   Resistance to Motion
   Propulsion
      Internal Combustion Engines
      Electric Motors
      Energy Efficiency
   Emissions Considerations

Section 9 - Para-Transit Concepts
   Dial-a-Ride
   Taxi
   Car Pools
   Van Pools
   Jitneys
   Subscription Bus
   Transport Brokerage
Section 10 - Evaluation
Impact Versus Administrative Evaluation Processes
Engineering Economic Analyses
POSSIBLE PROJECT TOPICS

1. Passenger Waiting Times
2. Passenger Boarding Rates
3. Passenger De-boarding Rates
4. Fare Elasticity: Changes in Demand Versus Changes in Fare
5. Fare Collection Systems
6. "Free" Transit
7. Driver Scheduling
8. Vehicle Scheduling
9. Spacing of Transit Terminals
10. Comparative Coasts of Transit Modes
11. Rural Public Transportation
12. Public Transportation Marketing
13. Energy: Case Studies
14. Perceptions of Public Transportation
15. New Technology
16. Labor and the Managerial Process
17. Financing Public Transportation
18. The Management of Public Transit
19. Rapid Transit Mode Selection
20. The Role of Private Industry
21. Urban Transportation and Land Use
22. The History of Federal Participation in Urban Public Transportation
23. A Survey of Transit System Productivity Based on Section 15 Reporting
24. Estimation of Time Rates of Passenger Arrivals at Transit Terminals
25. Transit Vehicle Dynamics and Passenger Comfort
26. Traffic Signal Priority for Bus Transit
27. Traffic Signal Priority for LRT