

**CE 391L - FALL 2002  
(14615)**

**ADVANCED TRAFFIC ENGINEERING**

**Instructor:** Dr. Randy Machemehl

**Office:** ECJ 6.902

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**Office Hours:** MW, 2:00-3:00 p.m., other times by appointment

**Lecture:** TTH 11:00-12:30 p.m., ECJ 5.418

**Textbook:** *Traffic Flow Fundamentals*, by Adolf D. May, Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 1990, ISBN 0-13-926072-2

**Course Supplement:** Class Notes Optional (Available at *Speedway Printing*)  
Notes available at <http://courses.utexas.edu>

**Prerequisites for CE 391L:**

Graduate standing required.

**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; 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.

**Attendance:**

Attendance at all scheduled class meetings is mandatory. A sign up sheet will be circulated 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:

Hour Exam 1	Thurs., 11:00-12:30 p.m.	October 3, 2002
Hour Exam 2	Thurs., 11:00-12:30 p.m.	November 14, 2002
FINAL EXAM	Wed., 2:00-5:00 p.m.	December 11, 2002

### **Grading Policy:**

Grades will be based on the following:

ITEM	DATE	PERCENTAGE
1. Hour Exam 1	Thursday, 3 October 2002	20
2. Hour Exam 2	Thursday, 14 November 2002	20
3. Homework (6 to 9 problems)		10
4. Project and Presentation*		20
5. Final Exam	Wednesday, 11 December, 2:00-5:00 p.m.	30
		100

### **\*Project Summary**

All class members will be given an opportunity to individually develop an investigation of a traffic engineering topic and present both written and oral discussions near the end of the fall 2002 semester. The approximate schedule for this activity is as follows:

1. Proposed Outline: Thursday, 12 Sept 2002
2. Final Outline: Thursday, 10 Oct 2002
3. Written Presentation Due: Thursday, 28 Nov 2002

#### 4. Oral Presentations: Tuesday, 3 Dec & Thursday, 5 Dec 2002

##### **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:**

September 2, 2002	Monday	Labor Day Holiday
September 3, 2002	Tuesday	Last day of the official add/drop period; after this date, changes in registration require the approval of the chairman and usually the student's dean.
September 13, 2002	Friday	Twelfth class day. Last day to drop a course for a possible refund.
September 25, 2002	Wednesday	Last day to drop a course without a possible academic penalty.
October 23, 2002	Wednesday	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.
November 28-29, 2002	Thurs/Fri	Thanksgiving Holiday.
December 6, 2002	Friday	Last class day.
December 11, 2002	Wednesday	CE 391L Final Exam, 2:00-5:00 p.m.

##### **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 TTY 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 the Undergraduate Catalog 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<sup>st</sup> through the 4<sup>th</sup> class day, an undergraduate student can drop or add a course on ROSE or TEX. From the 5<sup>th</sup> through the 12<sup>th</sup> 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<sup>th</sup> 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<sup>st</sup> through the 4<sup>th</sup> class day, graduate students can drop a course on Rose or TEX. Beginning with the 5<sup>th</sup> 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. Graduate students with GRA/TA/Grader positions or with Fellowships 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	Topic	Ref/Chapter/Pages	Activity*
I	Review of Basic Traffic Engineering		
	A. Driver, Vehicle, and Road Characteristics	1/1-3/all**	1
		4/2 and 3/all**	2
		12/1/all	2
	B. Traffic Control Devices and the MUTCD	2/all/all	2
II	Computer Simulation I	12/13/377-409	1
	Micro Simulation Models		
	A. TEXAS Model	10/all/all	2
		13/all/all	2
	B. CORSIM	7/all/all	2
		14/all/all	2
III	At-Grade Intersections		
	A. Macroscopic Characteristics		
	1. Flow	12/3/55-75	2
	2. Speed	12/5/117-145	2
	3. Density	12/7/195-214	2
	B. Queuing Analysis	12/12/339-360	1
	C. Traffic Control Techniques	1/23/345-353**	1
		4/17/782-789**	2
	D. Timing of Pretimed Signals	3/3/49-52**	1
		1/23/351-359**	1
		4/17/806-816**	1
	E. Timing of Actuated Signals	1/23/359-361**	1
		12/6/181-187	2
		3/9/299-318	2
	F. Capacity Analysis	12/9/247-279	1
		11/16/16-1 thru 16-36	1

\* Activity

Activity Code = 1: Read all pages carefully

Activity Code = 2: Read quickly, obtain conceptual understanding only

\*\* These references are on reserve in ECJ 6.900 for two-hour or overnight checkout.

## TOPICAL COURSE OUTLINE (Continued)

<b>Section</b>	<b>Topic</b>	<b>Ref/Chapter/Pages</b>	<b>Activity*</b>
IV	Computer Simulation II		
	Macro Simulation		
	TRANSYT-7F	9/all/all	2
	Optimization		
	PASSER II	8/all/all	2
V.	Arterial Street Traffic Operations		
	A. Microscopic Characteristics		
	1. Flow	12/2/12-36	2
	2. Speed	12/4/83-108	2
	3. Density	12/6/161-177	2
	B. Coordinated Signal	1/24/372-381**	1
		4/17/816-842**	2
		3/3/65-111**	2
VI.	Freeway Operations	11/23/23-1 thru 23-17	1
	A. Weaving Areas	11/24/24-1 thru 24-39	1
	B. Ramps	11/25/25-1 thru 25-40	1
	C. Flow Concepts Including Shock Waves and Bottlenecks	12/7/195-1212	2

\* Activity

Activity Code = 1: Read all pages carefully

Activity Code = 2: Read quickly, obtain conceptual understanding only

\*\* These references are on reserve in ECJ 6.900 for two-hour or overnight checkout.

## REFERENCES

1. Pignataro, Louis J., Traffic Engineering, Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 1983.
2. Manual on Uniform Traffic Control Devices, U.S. Department of Transportation, Federal Highway Administration, 1988.
3. Traffic Control Systems Handbook, U.S. Department of Transportation, Federal Highway Administration, Implementation Division, Washington, D.C., 1976.
4. Baerwald, John E., Matthew J. Huber, and Louis E. Keefer (Editors), Transportation and Traffic Engineering Handbook, Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 1976.
5. UVC MTO, National Committee on Uniform Traffic Laws and Ordinances, The Michie Co., Charlottesville, Virginia, Reviewed 1968.
6. Wohl, Martin and Brian V. Martin, Traffic System Analysis for Engineers and Planners, McGraw-Hill, 1967.
7. Traffic Network Analysis with NETSIM: A User's Guide, Federal Highway Administration, 1989.
8. PASSER II-87 User's Manual, TTI, July 1988.
9. User's Manual TRANSYT-7F, Federal Highway Administration, Washington, D.C., February 1988.
10. User Friendly Texas Model - Guide to Data Entry, Research Report No. 361-1F, Research Report No. 184-1, and Research Report No. 184.3, Center for Transportation Research, The University of Texas, Austin, TX, November 1985.
11. 2000 Highway Capacity Manual, Transportation Research Board, Washington, D.C., 2000.
12. May, Adolf D., Traffic Flow Fundamentals, Prentice Hall, Englewood Cliffs, N.J., 1990. **(TEXT)**
13. TEXAS Model Version 3.0 (Diamond Interchanges), Research Report No. 443-1F, Center for Transportation Research, The University of Texas, Austin, Texas, January 1989.
14. CORSIM User's Manual, US DOT, FHWA, 1998.