# North Carolina State University Department of Civil Engineering

# CE 305, Traffic Engineering Fall 2002

## Instructor

Joseph E. Hummer, Ph.D., P.E. Associate Professor 423 Mann Hall Office phone 515-7733, home phone 303-7740 Email hummer@eos.ncsu.edu

### **Meeting Time**

Monday, Wednesday and Friday, 11:20 a.m.-12:10 p.m.

### **Instructor Office Hours**

Monday 8:30-11:00 a.m. and 2:00-4:30 p.m. Tuesday 2:00-4:30 p.m. Wednesday 8:30-11:00 a.m. Call or email first to insure an appointment.

### **Course Emphasis**

- 1. Basic, practical tools
- 2. Operations and alignment design
- 3. Highways and streets

## Text

Papacostas, C.S. and P.D. Prevedouros, *Transportation Engineering and Planning*, Third Edition, Prentice-Hall, Inc., 2001.

### Evaluation

Alignment design report and drawings = 20%Alignment design presentation = 10%Three midterm exams @ 15% each = 45%Final exam = 25%

## Grading Scale

Percent of possible points	Assigned Grade
95.00 and above	A+
90.00-94.99	А
86.67-89.99	A-
83.34-86.66	B+
80.00-83.33	В
76.67-79.99	B-
73.34-76.66	C+
70.00-73.33	С
65.00-69.99	D
64.99 or lower	F

The instructor may give a higher grade to a student who just missed a cut-off shown above. In other words, a student with a final percentage of 86.5 may receive an "A-". These adjustments will be based on evidence of participation in class, group leadership during design project, or an upward trend in scores through the semester.

#### Late Assignments

Late assignments will be accepted, with a deduction of 10% of the assignment grade for each 24-hour period beyond the deadline.

#### Exams

The exams will be open-book and open-notes. The exams will follow the course objectives listed below, emphasizing open-ended problems and deep thinking. The first midterm exam will generally cover objectives in planning, the second midterm exam will generally cover design objectives, and the third midterm exam will generally cover operations objectives. The final exam will be comprehensive. The midterm exams will be scheduled for only 50 minutes, and the instructor's exams have usually been long, so students must think and solve quickly and accurately. The final exam is scheduled for three hours.

### Homework

The instructor will occasionally inform students of good problems for certain objectives. The instructor will distribute or post solutions for these problems. The instructor will not collect or evaluate students' solutions.

#### Project

A project will serve as an evaluation tool for the alignment design portion of the course. The project consists of specifying and defending a proposed horizontal and vertical alignment over terrain in Wake County. The project will be conducted in groups of three students, assigned on the basis of similar schedules. Groups will turn in one set of deliverables and receive one grade. To encourage equitable participation in the group, each student will keep a timesheet for the project. Group members must sign each other's timesheets and turn in the timesheets with the project report. Students not turning in timesheets, turning in unsigned timesheets, or turning in timesheets showing substantially less time on the project than other group members may have their grade for the project lowered from the group grade. Please notify the instructor of problems

within the group, such as a non-participating group member, well before the deadline so that there is time to make changes if needed. A group may share information, but not complete solutions, with other groups. Project deliverables include a report, a set of drawings, and an oral presentation.

#### **Disabled Students**

NC State is subject to the Department of Health, Education, and Welfare regulations implementing Section 504 of the Rehabilitation Act of 1973. Section 504 provides that:

"No otherwise qualified handicapped individual in the United States. . . shall, solely by reason of his handicap be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance."

This regulation includes students with hearing, visual, motor, or learning disabilities. The instructor will make "reasonable adjustments" to ensure that academic requirements are not discriminatory. Modifications may require rescheduling classes from inaccessible to accessible buildings, providing access to auxiliary aids such as tape recorders, readers, note takers, or interpreters. Exams will actually evaluate students' progress and achievement rather than reflect their impaired skills. This may require oral or taped tests, readers, scribes, separate testing rooms, or extension of time limits. See the instructor to arrange reasonable adjustments such as these.

#### **Academic Integrity**

The University policy on academic integrity is in the Code of Student Conduct (found in Appendix L of the *Handbook for Advising and Teaching*). The instructor expects exams in this course to be prepared by students working alone, and expects project reports to give proper credit to original sources of information. The instructor's understanding and expectation is that students submitting an exam or report abided by the NC State Honor Pledge, i.e., "I have neither given nor received unauthorized aid on this test or assignment."

#### Safety and Risk Assumption

Students may occasionally have to collect data in the field during the project. This may involve crossing or standing beside roadways. Students standing in the roadway right-of-way to collect data should wear orange reflective safety vests—see the instructor to borrow a vest before field data collection. Students should take all other normal safety precautions during these activities. Otherwise there should not be any additional risk experienced during this course.

#### **Pass-Through Charges**

Students should expect no additional required charges during this course.

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Date	Reading	Objective
8/19		Understand course organization
8/21	Sec. 9.1 & 9.2	Understand the differences between the types of transportation planning
8/23		Estimate the trips generated at a site or in a zone
8/26		Continued
8/28		Continued
8/30		Estimate the distribution, mode split, and assignment of trips
9/4		Continued
9/6	Sec.4.3-4.4 & 6.1-6.4	Compare public transportation modes
9/9		Continued
9/11		Continued
9/13		Understand the project organization
9/16	Handout	Solve simple traverse problems
9/18		Continued
9/20		Midterm exam
9/23	Ch. 11 & App. A	Select the optimum corridor for a new alignment
9/25		Continued
9/27		Continued
9/30	Sec. 2.4.1-2.4.6	Design simple circular highway curves
10/2	<b>TT</b> 1 /	Continued
10/4	Handout	Design nighway curves with spirals
10/7	Sec. 2.4.7-2.4.10	Design a new highway vertical alignment
10/9	II	Continued
10/11	Handout	Learning writing and appolying skills
10/10	Handout	Midterm exem
10/10	Uandout	Identify hezerdous highway sites
10/21	Handout	Continued
10/25	Handout	Propose and justify collision countermeasures
10/23	Handout	Continued
10/20		Design presentations
11/1		Continued
11/1	Sec. 3.3-3.4	Understand basic traffic flow relationships
11/6	500. 5.5 5.1	Continued
11/8	Sec. 4.5	Estimate the level of service of basic freeway segments
11/11	500. 1.5	Continued
11/13	Sec. 4.9.5 & Website	Recommend an appropriate intersection traffic control device
11/15	Sec. 4.6.1-4.6.3	Provide settings for actuated traffic signals
11/18	Sec. 4.6.4	Time pre-timed traffic signals
11/20	~~~~	Continued
11/22		Continued
11/25		Midterm exam
11/27	Sec. 4.6.5-4.6.6	Optimize simple signal systems using time-space diagrams
12/2	Sec. 4.7	Estimate the level of service of basic signalized intersections
12/4		Continued
12/6		Continued
12/11,	8 a.m.	Final Exam