

**DEPARTMENT OF CIVIL ENGINEERING
TRANSPORTATION ENGINEERING
CIVL 441 FALL 2006**

INSTRUCTOR: Dr. DingXin Cheng
Office: Langdon 209H Phone: 898-5114
Office Hours: MW 10:20 AM to 11:10 AM and R 10:00 AM to 10:50 AM

COURSE HOURS: MWF 9:00AM-9:50AM
Laboratory Section 2 M 2:00PM-4:50PM
Laboratory Section 3 T 11:00AM-1:50PM
Laboratory Section 4 R 11:00AM-1:50PM

BASIS OF EVALUATION: Grades will be based on a course score determined as follows:

Laboratory Assignments	15%
Homework Assignments	5%
2 Midterm Exams	40%
1 Final Exam	25%
Term Project (5 Stages)	15%

The midterm exams will be held **about** the sixth and thirteenth weeks of the semester. The final exam will occur **Monday December 11, 2005 from 10:00 to 11:50 AM** in GLNN 327. The exams will be open book and notes. Class handouts will be required.

A course score based on the above weighting system will be established for each student. The standard course score is based on the mean assignment and examination grades with unsatisfactory and missing work eliminated from computation of the mean. The standard course score will be the approximate break between a B- and a C+. Twenty percent below the standard score will be the approximate break point between a D and an F. The top course score has always equated to an A grade and very likely will this term.

The above grade standards will apply to students who consistently display positive professional attributes. Missing examinations or failing to adequately complete and turn in **all** assignments on time is not consistent with good professional practice. Students missing assignments and deadlines will not be graded on the above basis but at the discretion of the instructor. This discretion will not be applied in a random or arbitrary manner. Late assignments may be accepted at the discretion of the instructor. There may be grade penalties for late assignments. Every effort should be made to get prior agreement and acceptance of the instructor prior to missing a deadline. The discretion might be used to help students should unfortunate, uncontrollable events occur. Missing a class session may cause you to miss an assignment and thus be graded at the discretion of the instructor. The instructor will make a special effort to include material from lecture on exams whenever there is light attendance. The statements in this paragraph take precedence over all other written statements relating to late or missing work.

Completing **all** assignments helps you at least four ways:

1. You will develop good professional habits that will serve you well in a professional career.
2. Knowledge and experience gained may put you at an advantage during an examination.
3. You get credit for your work, which will enhance your course score.
4. Your grade will be based upon a class standard that you and your classmates have established. The uncertainty of being graded at the discretion of the instructor is eliminated.

ASSESSMENT

SPECIAL PROGRAM ASSESSMENT:

In addition to the above grading criteria there are special criteria that all students must satisfy in order to pass CIVL 441. The specific criteria are listed on the next page.

I. Ability to design and conduct experiments, as well as to analyze and interpret data.

The focus in CIVL 441 is more on the ability to analyze and interpreted data than on the design of experiments. The laboratory projects require that a fixed procedure be followed in collecting data. The laboratory reports on the topics of traffic spot speed studies, and traffic volumes studies, traffic accident studies, public transit usage, and origin destination analysis all require comprehensive reports. Each report is given the score between 0 in 15. Considered in the scoring is report format, neatness, the accuracy and thoroughness of results, a discussion of relevance and accuracy, and students conclusions. An appendix containing data collected in sample calculations is also evaluated. Each student is required to complete all six reports. A student must receive a score 11 or better on a minimum of two of the reports.

II. Ability to identify, formulate, and solve engineering problems.

The student is required to prepare a formal proposal that leads to a formal design study report in several stages. In evaluating alternatives for final recommendation, the student must propose design criteria/constrains and evaluate each alternative based on the criteria. The measure of proficiency is the student's formulation and solution of a design problem. The evaluation of this concept is not easily made quantitative. The instructors will provide comments and feedback to the student on problem formulation and evaluation in the proposal review and in evaluating the remaining 4 stages of the project. A clear process must be presented by the student that includes the steps: establishment of design criteria and constraints, development of alternatives, evaluation of alternatives, and final recommendation based on the process.

III. Broad education necessary to understand impact of e engineering solutions in a global and societal context.

The student is required to prepare a formal proposal that leads in stages to a formal design study report. In evaluating alternatives for final recommendation, the student must propose design criteria/constrains and evaluate each alternative based on the criteria. The measure of proficiency is the student's consideration of items other than engineering standards and cost. Consideration of societal issues and global impact of the student's recommendation is required in the final design report. The evaluation of this concept is not easily made quantitative. The instructors will provide comments and feedback to the student on societal and global issues in the proposal review and in evaluating the final design project. Some attention to societal and global issues must be included in every design report.

Students not meeting all of these assessment standards will be given an incomplete in CIVL 441 if their overall course grade is D or better. A statement will be filed in the department office that specifies work that must be completed in order to clear the incomplete. Once work is completed the original course grade will be assigned. The work must be completed prior to March 1, 2005 or the incomplete will be converted to an F grade and the student will be required to repeat CIVL 441.

COURSE PREREQUISITES: Transportation Engineering, possibly more than other courses in the Civil Engineering program, relies upon a broad spectrum of other courses. Consequently, this course is designed to help the student apply to transportation problems; information learned in such courses as:

CIVL 131 Introduction to Design - required

CIVL 411 Soil Mechanics and Foundations - recommended

CIVL 402 Contracts/Specs/Tech Reports - recommended

CIVL 302 Engineering Econ & Statistics - recommended

APPROXIMATE COURSE OBJECTIVES:

1. To introduce students to the 1) basic transportation functions by **mode** and in a **systems** context, and 2) transportation concepts and terminology.
2. To provide students with a **good** background in transportation characteristics, operations, **design**, planning, and maintenance.
3. To teach students **principles, concepts** and **methods** unique to transportation, i.e., demand modeling, capacity analysis, traffic engineering, geometric design, pavement design, and pavement maintenance.
4. To provide students experiences with the **collection** and **analysis** of transportation data for use in design. Also students will gain experience in statistical analysis, use of computers and computer programming.
5. To improve students' ability in preparing **formal** reports and describing complex design procedures.
6. To provide students with a **capstone design** experience-integrating material from this course and from other courses. Students will need to make **judgments** throughout the design experience and work with substantial independence.

APPROXIMATE OUTCOMES:

Students completing the course will be able to:

- Prepare basic designs of highways, runways/taxiways, harbor channels, and rail lines.
- Determine the basic structural section of highways and runways/taxiways.
- Collect, reduce, analyze, and evaluate transportation field data.
- Conduct capacity analysis for various modes of transportation.
- Demonstrate a formal modeling procedure including calibration and verification.
- Perform simple travel forecasts.
- Demonstrate knowledge of transportation planning, maintenance, environmental, financing, and administrative issues.

REQUIRED COURSE DOCUMENTS: (To be purchased from the ITE student chapter)

Transportation Engineering Basics

Transportation Engineering Basics Laboratory Workbook

APPROXIMATE COURSE TOPICS:

1. Introduction
2. Highway Geometric Design
3. Highway Traffic Operations, Capacity, and Control Systems
4. Airport Design
5. Transportation Pavements
6. Harbor Design
7. Public Transportation
8. Transportation Planning
9. Pedestrian Practices
10. Transportation, Energy, and Air Pollution
11. Financing Transportation Improvements
12. Transportation Maintenance Systems
13. Administration of Transportation Functions