

**CEE 362 – TRANSPORTATION ENGINEERING (Required)
Spring 2006**

Instructor: Dr. Zong Tian, P.E. **Office:** SEM 221

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Office Hours: Tuesday and Thursday: 10 am to 11 am and 2:00 to 3:00 pm or anytime I am in my office

Time and Day: Tuesdays and Thursdays: 4:00 – 5:15 p.m.

Location: AB 106

Description: Fundamental principles and methods in planning, design, and operation of transportation systems; highway geometric, traffic safety, and pavement design principles; traffic analysis and transportation planning.

Prerequisites: MATH 285, CEE 121

Text: Traffic and Highway Engineering, 3rd Edition, Nicholas J. Garber and Lester A. Hoel, Brooks/Cole, 2002, ISBN: 0534387438.

Additional References: Highway Capacity Manual 2000, Transportation Research Board (TRB)
Manual of Transportation Engineering Studies, Institute of Transportation Engineers (ITE).
A Policy on Geometric Design of Highways and Streets, American Association of State Highway and Transportation Officials (ASSHTO), 2004.

Goal: To acquaint students with the basic concepts, theory, and practice of transportation engineering as related to planning, design, and operations of the transportation system.

Objectives:

- Familiarize the fundamental principles and concepts that are used in the design of highway systems and apply these principles in the design of simple geometric features, such as horizontal and vertical alignment, earthwork computations, and pavement design (a, b, c, e, k).
- Describe the fundamental parameters and relationships that are used to characterize the operation of a transportation facility, and describe methods for monitoring, assessing and improving the performance of those facilities (a, f, h).
- Perform capacity and level of service analyses on highway intersections, freeways, and public transit facilities using traffic engineering software (j, k).
- Familiarize the traditional four-step planning process, and apply the principles in conducting travel demand forecasting, trip generation, and trip distribution analyses (a, b, h, j, k).

Topics Covered:

Speed, Volume, and Delay Studies
 Fundamental Principles of Traffic Flow
 Design of Vertical Alignment, Horizontal Alignment, Superelevation, Cross Sections, Intersections and Interchanges
 Earthwork Calculations
 Airport and Aviation
 Design of Flexible and Rigid Pavements
 Capacity Calculations of Uninterrupted and Interrupted Traffic Facilities
 Intelligent Transportation Systems
 Transportation Planning Principles
 Transit Operations
 Transportation Safety Analysis

ABET Outcomes Addressed:

Ability to apply knowledge of basic mathematics, science, and engineering
 Ability to design a civil engineering system to meet desired needs
 Ability to formulate and solve civil engineering problems
 Ability to communicate effectively (verbal and written)
 Understanding of the impact of civil engineering solutions in a global/societal context
 Appreciation and knowledge of current civil engineering issues
 Ability to use techniques, skills, and modern tools necessary for civil engineering practice

Grading:

Midterm Exam:	1	20%
Final Exam:	1	30%
Quizzes:	2	15%
Homework	infinite	20%
Project	1	10%
Class Attendance		5%
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Total		100%

Grade Scale

A	90-100	B	80-90
C	70-80	D	60-70
F	<60		

Disability Statement:

If you have a disability for which you will need accommodations, please contact me or Mary Zabel at the Disability Resource Center (Thompson Student Services – 107), as soon as possible to arrange for appropriate accommodations.

Course Schedule

Table 1
Course Schedule – CEE 362: Transportation Engineering

Week	Date	Topics	Reading
1	1/24(TRB) 1/26	Overview: Transportation Systems and Engineering Topic 1: Traffic Engineering Studies I (Speed)	Ch. 1&2 Ch. 4, HCM
2	1/31 2/2	Traffic Engineering Studies II (Volume) Topic 2* (C. Reider, NDOT): Highway Safety	Ch. 5, Handouts
3	2/7 2/9	Highway Safety (open) Topic 3: Geometric Design: I	Ch. 16
4	2/14 2/16	Geometric Design: II Geometric Design: III	
5	2/21 2/23	Geometric Design: IV Topic 4: Fundamentals of Traffic Flow	Ch. 6
6	2/28 3/2	Topic 5* (T. Baldwin, PBS&J): Airport and Aviation: I Topic 6: Uninterrupted Facilities: Freeway Operations	Handouts Ch. 9
7	3/7 3/9	Topic 7: Interrupted Facilities I (Intersection Control) Interrupted Facilities II (Signal Operations)	Ch. 8 Ch. 10
8	3/14 3/16	Midterm Exam Review Midterm Exam	
9	3/20~3/26	Spring Break	
10	3/28 3/30	Interrupted Facilities III (Capacity and LOS) Interrupted Facilities: IV (Signal Systems)	Handouts
11	4/4 4/6	Topic 8: Transportation Planning: I Transportation Planning: II	Ch. 12, Handouts
12	4/11 4/13	Transportation Planning: III Transportation Planning: IV	
13	4/18 4/20	Topic 9* (J. Poston, RTC): Intelligent Transportation Systems Topic 10* : (R. Gibby, NDOT) Public Transit	Handouts Handouts
14	4/25 4/27	Open Special Topic* (S. Martinovich, NDOT)	
15	5/2 5/4	Topic 11* (S. Alavi, STG): Pavement Design: I Pavement Design: II	Ch. 20 Handouts
16	5/9 5/11	Final Review Final Exam	

*Note: 1. Topics with * indicate guest lecturers; 2. The course schedule is subject to change depending on student's performance*