

Tennessee Technological University  
Department of Civil & Environmental Engineering  
CEE 3610 – Transportation Engineering  
Required  
Fall Semester 2007, Spring Semester 2008

2007 Catalog Data:	CEE 3610. Transportation Engineering. Lecture 3. Credit 3. Introduction to transportation engineering; planning, location, design and operation of transportation facilities. Prerequisite: CEE 3020.
Textbook:	James H. Banks, <i>Introduction to Transportation Engineering</i> , 2 <sup>nd</sup> Edition McGraw Hill, 2001.
Reference:	None
Coordinator:	Daniel A. Badoe, Associate Professor of Civil Engineering
Goal:	The goal of CEE 3610 “Transportation Engineering” is to introduce students to the planning, design, and operation of transportation systems.

Course learning objectives:

1. The student is to become familiar with some of the major issues and challenges transportation engineers are faced with.
2. The student is to become familiar with the fundamentals of the planning, design, and operation of some of the modal facilities in the U.S. transportation system – students will learn how to perform simple analysis in each of these areas and become familiar with some of the terminology.
3. The student is to become familiar with a discussion of some of the future development in transportation.

Course measurable outcomes:

Students will be expected to:

1. know definitions of basic descriptors of the transportation system;
2. discuss fundamental issues facing transportation engineers;
3. perform simple analysis associated with the planning of transportation systems, namely, trip generation, trip distribution, mode choice, and traffic assignment;
4. design a simple vertical curve to satisfy sight distance, drainage, aesthetic, comfort requirements and compute elevations along vertical alignment;
5. design a simple horizontal curve to satisfy sight distance requirements and compute required superelevation for a horizontal curve;
6. determine sight distance requirements for simple intersections;
7. compute areas of cut and fill sections, and the volumes associated with earthworks;
8. know definition of noise, how it is measured, how it is propagated, and how noise levels at a site may be attenuated; and
9. perform simple calculation on the performance of transportation systems, namely, determining capacity, delay, speeds, headway, flow, and volumes for highways and isolated signalized intersections.

Topics covered: (Three lecture classes per week, 55 minutes each)

1. Introduction to transportation systems (6 classes)
2. Issues in Transportation (congestion, air pollution, safety, mobility, etc.) (2 classes)
3. Urban Transportation Planning (7 classes)
4. Design of Transportation Facilities (10 classes)
5. Earthworks and Pavement Design (2 classes)
6. Transportation System Performance (11 classes)
7. Environmental Impacts – Noise (1 class)
8. Tests (3 classes)

Contribution of the course to meeting professional component:

This course is a part of the engineering topics component of the curriculum.

ABET category content as estimated by faculty member who prepared this course description:

Engineering Science: 2.5 credits or 83%  
Engineering Design: 0.5 credits or 17%

Relation of course to program outcomes:

- Outcome 1: The graduates will have a broad understanding of the relevant principles of mathematics, science, and engineering.  
Outcome 2: The graduates will have a general comprehension of four technical areas appropriate to civil engineering.  
Outcome 4: The graduates will be capable of design activities and have the ability to identify, formulate, and solve civil engineering problems.  
Outcome 5: The graduates will have effective communication skills.  
Outcome 8: The graduates will have the ability to use techniques, skills, and modern engineering tools needed for engineering practice.

Relation of course to ABET Criteria:

General Criteria

Bloom's Level of Achievement

- |  |   |
|--|---|
| (3a) Knowledge of math, science, engineering                   | 3 |
| (3c) Design a system, component or process                     | 3 |
| (3e) Identify, formulate, and solve engineering problems       | 3 |
| (3j) Knowledge of contemporary issues                          | 2 |
| (3k) Techniques, skills, modern tools for engineering practice | 3 |

Program Criteria

Bloom's Level of Achievement

- |  |   |
|--|---|
| 1. Apply knowledge of math and sciences  | 3 |
| 2. Apply knowledge of four technical areas appropriate to civil engineering          | 3 |
| 3. Design a system, component, or process in more than one civil engineering context | 3 |

Computer usage:

1. CADD Software. Students will use CADD software to complete assignments in transportation design.
2. HCS+ Software. Students will use the HCS+ professional software to complete assignments in traffic operations.
3. Spreadsheets and Word Processing. Students will use general software packages like word processors and spreadsheets to complete assignments throughout the course.

Laboratory projects: None required.

Prepared by: D.A.Badoe

Date: September 2007