

Tennessee Technological University
Department of Civil & Environmental Engineering
CEE 4660 (5660) – Transportation Planning
Elective
Fall Semester 2007

- 2007 Catalog Data: CEE 4660 (5660): Transportation Planning. Lecture 3. Credit 3. System planning and evaluation. Characteristics, impacts and costs. User patterns. Alternative analysis. Prerequisite: CEE 3610.
- Textbook: C.S. Papacostas and P.D. Prevedouros (2001), *Transportation Engineering and Planning* 3rd Edition
- Reference: Transportation Research Record Series on Transportation Planning
- Coordinator: Dr. D. A. Badoe, Associate Professor of Civil Engineering
- Goal: The goal of CEE 4660 (5660) “Transportation Planning” is to introduce students to the planning of urban transportation systems.

Course learning objectives:

1. The student is to become knowledgeable of how to design and execute an urban transportation planning study.
2. The student is to become knowledgeable of transportation planning analysis skills, especially relating to travel demand analysis, and the collection and use of survey data.
3. The student is to become familiar with current transportation planning issues and policies.
4. The student is to become familiar with the overall process of transportation planning and its role within the wider context of transportation decision-making.

Course measurable outcomes:

Students will be expected to:

1. understand the historical development of urban transportation planning, and current legislation that guide the planning process;
2. distribute population and economic activity using the Potential Model, and the Disaggregate Residential Allocation Model;
3. know the different methods for conducting Origin-Destination surveys and Household Travel Behavior Surveys;
4. predict changes in modal patronage from demand elasticities;
5. predict the number of trips generated by a household using Cross-Classification Analysis, and Linear Regression Analysis;
6. distribute zonal trips generated using the biproportional method of updating, and the gravity model;
7. predict mode split using trip end mode split models, and disaggregate multinominal logit models;
8. understand how vehicular traffic is assigned to a transportation network using user-equilibrium techniques;
9. predict noise levels from vehicular traffic on transportation facilities; and
10. understand of how transportation alternatives are evaluated.

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

1. Transportation planning – history, legislation, process, and outputs (3 classes)
2. Land-use forecasting (2 classes)
3. Urban travel characteristics (2 classes)
4. Simplified Methods of travel demand modeling (2 classes)
5. UTMS – trip generation (4 classes)
6. UTMS – trip distribution modeling (4 classes)
7. UTMS – modal choice (3 classes)
8. UTMS – traffic assignment (5 classes)

9. Transportation economics (3 classes)
10. Travel Surveys (3 classes)
11. Traffic Noise. (3 classes)
12. Transportation system performance (6 classes)
13. Exams (2 classes)

Contribution of the course to meeting professional component:

This course is a part of engineering topics of the curriculum and is an elective.

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

Engineering Science: 2.0 credits or 67%
 Engineering Design: 1.0 credits or 33%

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 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:

<u>General Criteria</u>	Bloom's Level of Achievement
(3a) Knowledge of math, science, engineering	3
(3c) Design a system, component, or process	5
(3g) Effective communication	4
(3j) Knowledge of contemporary issues	2
(3k) Techniques, skills, modern tools for engineering practice	3

<u>Program Criteria</u>	Bloom's Level of Achievement
1. Apply knowledge of math and sciences	3
2. Apply knowledge of four technical areas appropriate to civil engineering	4
3. Design a system, component, or process in more than one civil engineering context	5

Computer usage:

1. Spreadsheet and Word Processor packages are used to complete several assignments, and a term project.
2. HCS+ Software is used in capacity analysis in the term-project, and also to complete assignments on capacity analysis of selected transportation facilities.

Laboratory projects: Traffic impact study.

Prepared by: D. Badoe

Date: August 2007