

1. ***Department, number, and title of course***

Department of Civil Engineering, CENG 5354, Urban Transportation Planning

2. ***Graduate Course***

3. ***Course (catalog) description***

Overview of the four-step urban transportation planning process, estimation of the travel demand models of trip generation, trip distribution, mode choice, and traffic assignment, and forecasting of travel patterns using travel demand models, state-of-the-art approaches and transportation network analysis for evaluation of system alternatives. Co-listed with CENG 4354. The graduate student will complete an additional project.

4. ***Prerequisite(s)***

CENG 3351 Transportation Engineering

5. ***Textbook(s) and/or other required material***

Modeling Transport, 3rd Edition, by J. Ortuzar and L.G. Willumsen. Published by Wiley, ISBN 0-47-186110-3, 2001.

6. ***Course Objectives***

- Explain the general 4-step travel forecasting model involved in the transportation planning process.
- Develop the transportation systems analysis process using concepts including supply-demand models and network equilibration.
- Estimate and predict the trip generation using techniques including regression analysis and category analysis.
- Calculate and predict the trip distribution using techniques including growth factor model and gravity model.
- Estimate and predict the mode choice using techniques including discrete choice logit model.
- Estimate and predict the route choice and network equilibration using techniques including Wardrop's principles, network loading methods, and network equilibration.
- Predict and interpret the network design and project evaluation process including forecasting for future alternatives and comparative evaluation of alternatives.
- Use commercially available software such as TransCAD to conduct transportation planning and travel demand forecasting.

7. ***Topics Covered***

- Introduction to Transportation Planning Process, 4-Step Travel Forecasting Model, and Survey Data and Network Data
- Transportation Systems Analysis: Supply Models, Demand Models, and Network Equilibration
- Statistical Analysis: Ordinary Least Squares, Geometry of Regression Line, Goodness of Fit
- Trip Generation: Regression Analysis and Category Analysis
- Trip Distribution: Growth Factor Model and Gravity Model
- Mode Choice: Discrete Choice Models and Binary Logit Model
- Route Choice and Network Equilibration: Wardrop's Principles, Network Loading Methods, and Network Equilibration
- Network Design and Project Evaluation: Forecasting for Future Alternatives and Comparative Evaluation of Alternatives

8. Class/laboratory schedule, i.e., number of sessions each week and duration of each session

LESSONS: 45 @ 50 min (3.0 Att/wk)

LABS: None

9. Contribution of course to meeting the professional component

3.0 Credit Hours (ES=1.5, ED=1.5)

This is a graduate level transportation engineering course that focuses on state-of-the-art transportation planning models and techniques used to estimate and forecast travel demand for future transportation systems. The course incorporates government and industry standard manuals and software for engineering planning. It provides the principles of transportation planning and demand forecasting needed in transportation industry planning and analysis.

10. Relationship of course to program outcomes

The course director's assessment of how this course contributes to the civil engineering program outcomes is listed below. The following scale is used:

1=No Contribution; 2=Small Contribution; 3=Average Contribution; 4=Large Contribution; 5=Very Large Contribution

CIVIL ENGINEERING PROGRAM OUTCOMES	Course Director Assessment
Program Outcomes	
Students who qualify for graduation with a civil engineering masters will demonstrate:	
Have specialized knowledge in an area of civil engineering beyond that normally expected at the undergraduate level.	5
Are adequately prepared for advanced professional practice.	3
Completing a thesis or design project address a civil engineering problem using sound engineering principles and techniques.	3
Solve an engineering problem of importance to the State, the Nation, or the Global community.	1
Demonstrate the ability for independent life-long learning.	2
Have effective oral, written, and graphical communication skills.	2

11. Person(s) who prepared this description and date of preparation

Dr. Wei (David) Fan, E.I.T., Assistant Professor, 6 June 2008.