

SYLLABUS

USP 587: Introduction to Travel Demand Modeling

Winter 2010, Thursdays, 4:00 p.m. to 6:30 p.m.

Room 225 Urban Center (URB)

Instructor: John Gliebe

Office hours: Thursdays, 2 p.m. to 4 p.m., or by appointment

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* Note: Class will not be held on January 14 due to the TRB meeting in Washington, D.C.

COURSE OBJECTIVES

Upon completing this course students should have a solid understanding of the theory and methods underlying the practice of urban travel demand modeling. Travel demand modeling has historically been portrayed as a “four-step process;” however, it actually involves many more steps, particularly if done thoughtfully. State-of-the-art modeling concepts and techniques will be introduced.

A variety of computer application packages, database programs, scripting languages, and statistical software are available for travel demand modeling application and development, and students will receive some exposure to a handful of these tools. The emphasis in this course, however, will be on the more enduring non-software-specific lessons—theory, methods, and analytical problem solving—which are common to the discipline.

At the end of this course, students should be able to answer the following questions:

- How are travel demand models used in the field of transportation planning?
- In the context of urban transportation planning, what modeling methods are available for the analysis of human activity patterns and travel-related decision making?
- What sources of data are needed for model development?
- What are the behavioral and statistical limitations of the data?
- What are the effects of data aggregation bias and how does it relate to market stratification?
- How are the temporal and spatial dimensions of travel represented in model design?
- What do model structure and variable specification imply about behavioral sensitivity?
- How does the need to produce forecasts drive model design and specification?
- How are the economic concepts of equilibrium, utility, elasticity, and value of time represented in travel demand modeling?
- What are the basic methods used to estimate and calibrate models?
- What methods may be used to validate travel demand models?
- What methods are used to analyze and present results?
- Where is the field of travel demand modeling headed in terms of advanced practice?

TEXT AND COURSE WEBSITE

There is one required textbook for the class, with additional readings handed out by the instructor in class and via the course website. The textbook we will be using is Modelling Transport, 3rd Edition, by Juan de Dios Ortuzar and Luis G. Willumsen. The course Blackboard website will include this syllabus, supplemental reading materials, assignments, and a class email message and discussion forum. Lecture notes will also be posted on the website after each lecture. The website may be accessed by directing your web browser to <http://www.psuonline.pdx.edu/> and logging on using your ODIN account name and password. Persons who do not have an ODIN account number may temporarily log-in using the guest account username “guest43883” and password “arcupere”.

STRUCTURE OF THE COURSE

This course will be a combination of lectures, in-class computer demonstrations and exercises, and individual homework assignments. There also will be a final exam covering the entire class.

- Lectures will cover the topics listed in the outline below. While most of the material is covered adequately in the textbook, additional readings will be distributed either in class or via the Blackboard class website.
- Homework Assignments will involve completing analytical exercises designed to build skills in travel demand modeling and to reinforce concepts discussed in the class lectures. They are to be completed individually and tend to build on each other as the term moves forward. For this reason, later assignments will be weighted more heavily than earlier ones. Additional instructions will be provided with each assignment.

ASSIGNMENTS AND GRADING

Grading will be as follows: Homework assignments: 75%

1. Assigned January 21; Due January 28, 2010
2. Assigned January 28; Due February 4, 2010
3. Assigned February 4, 2010; Due February 11, 2010
4. Assigned February 11; Due February 25, 2010
5. Assigned February 25; Due March 12, 2010

Final Exam: 20% March 18, 2010 (tentative)

Class participation: 5%

TENTATIVE COURSE OUTLINE – WINTER 2010

1. Introduction
2. How models are used
3. What makes a good model
4. Data and sampling
5. Generating trips
6. Distributing trips
7. Choosing modes
8. Network assignment
9. Feedback
10. Analysis of results