TRAN 603-101: Introduction to Urban Transportation Planning

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Recommended Citation
TRAN 603 – Introduction to Urban Transportation Planning
Section: 101 Fall 2018

Instructor

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Class:
KUPF 202 (6:00 PM ~ 9:00 PM on Thursday)

Office Hours:
3:00 PM ~ 6:00 PM on Thursday

Course Description

The course will introduce the concepts of urban travel analysis, community and land activity related to transportation systems, and socio-economic aspect of transportation planning. The knowledge of the analytical models, including the design and use of mathematical models for the estimation of transport demand in the framework of major strategic transportation planning will also be discussed.

Course Objectives

- Understand the principles and practices of urban transportation planning
- Understand the interactions between transportation planning and socio-economic, demographic, and land use characteristics
- Learn transportation planning processes and forecasting models
- Attain the capability to deal with transportation planning problems within the context of society, data availability and practical constraints

Course Content

The course consists of a number of lectures, and several exercises. The following subjects will be covered:
The functions of models in the transportation system analysis.

Types of models and their applications.

Theoretical foundations (travel choice theory).

Aggregated models for trip generation, distribution, model split and network assignment.

Disaggregated choice models.

Estimation of model parameters and calibration.

**Final Attainment Level**

After completing the course the students are expected:

1. To have knowledge of the urban transportation planning process

2. To have knowledge of the structure of the modeling analysis process in transportation planning, of the related computational models, their theoretical foundations and their behavioral backgrounds.

3. To have insight into the operation of the quantitative analysis process in transportation planning, in the derivation, the operation and the application possibilities of the different types of transportation models, as well as in the estimation process of model parameters based on travel and traffic observations.

4. To attain skills in:
   - Building a system description of a transportation network
   - Setting up simple transportation planning models
   - Calculating and analyzing transportation demand
   - Interpreting model results.

**Instructional Material**


- Class Notes, Handouts, PowerPoint presentations, and narrated lectures
## Tentative Course Outline

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Textbook</th>
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| Sep 6  | Course Introduction  
Purpose and Goals of Transportation Planning  
Urban Transportation Planning Process  
Systems Approach to Transportation Planning | Ch. 1 ~ 3         |
| Sep 13 | Transportation Demand  
Transportation Cost  
Concepts of Demand Elasticity | Ch. 5             |
| Sep 20 | “Four-Step” Transportation Demand Modeling                             | Ch. 4 ~ 5         |
| Sep 27 | Trip Generation  
Regression Models and ITE Trip Generation Book  
Cross-Classification Models | Ch. 5 Class Notes |
| Oct 4  | Trip Distribution  
Gravity Model  
Calibration of a Gravity Model | Ch. 5 Class Notes |
| Oct 11 | Modal Split (Mode Choice)  
User Utility Theory  
Calibration of a Modal Split Model | Ch. 5 Class Notes |
| Oct 18 | Midterm Exam                                                          |                   |
| Oct 25 | Transportation Network Design  
Transportation Supply Analysis | Ch. 7. Class Notes |
| Nov 1  | Traffic Assignment (I)  
Network Equilibrium: User Equilibrium and System Optimal | Ch. 5 Class Notes |
| Nov 8  | Traffic Assignment (II)                                               | Ch. 7 Class Notes |
| Nov 15 | Contemporary Urban Transportation Planning Problems:  
Congestion Pricing, Transit Planning and Transit Oriented Development, Goods Movement | Class Notes |
| Nov 22 | Land Use Modeling (Tuesday Follow Thursday Schedule)                  | Ch. 6             |
| Dec 6  | Final Exam                                                            | Ch. 1 ~ 7         |
| Dec 13 | Final Exam Due                                                        |                   |
Homework
There will be 5~8 homework assignments following the lectures, which shall be completed independently.

Exams
There will be a midterm and a final exam, which shall be completed independently.

Grading
Midterm Exam 30%
Final Exam 30%
Homework 30%
Class Participation 10%

General Policy
Assignments and exams are to be completed by the due dates. Late submission will not be acceptable.

Makeup Policy
There will be no makeup for exams unless there are justifiable circumstances.

Code of Conduct
The NJIT honor code (http://www.njit.edu/academics/pdf/academic-integrity-code.pdf) will be upheld throughout the term for this course, and students are expected to abide by it. Any breach of code will result in failure of the course at the least and will be brought to the immediate attention of the Dean of Students leading to suspension or dismissal from the university.

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