Summer 2019

TRAN 603-851: Introduction to Urban Transportation Planning

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CIVIL AND ENVIRONMENTAL ENGINEERING

NJIT New Jersey Institute of Technology

TRAN 603 – Introduction to Urban Transportation Planning – Summer 2019
Section: 851

Instructor

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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 of a region, as well as the context of transportation planning within regional master plans.
- Learn about transportation planning and forecasting models and transportation planning technology.
- Attain the capability to deal with transportation problems within the context of society, data availability and limitations of analysis tools.

Course Content

The course consists of a number of lectures, and several exercises. In the lectures the following subjects will be presented:

- 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.

The exercises have two functions:

- Getting acquainted with and learning about practice-oriented software for modeling transportation demand and network analysis.
- Solving a transportation planning problem with the use of the relating model tools.

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 operational models.
    - Applying different types of models for the calculation of the transportation demand.
    - Interpreting model results.
    - Working with software for transportation calculations.

Instructional Material

- **Textbook**: Michael D. Meyer and Eric J. Miller, Urban Transportation Planning, 2nd Edition, The McGraw-Hill Companies, 2000. ISBN-10: 0072423323.
- Class Notes, Handouts, PowerPoint presentations, and narrated lectures

Tentative Course Outline

Week	Topic	Assignment
1	Introduction: Purpose and Goals of Transportation Planning Urban Transportation Planning Process Systems Approach to Transportation Planning	Ch. 1, Ch.2, Ch. 3
2	Transportation Demand Transportation Cost Concepts of Demand Elasticity	Ch. 5 HW 1 Assigned
3	"Four-Step" Transportation Demand Modeling	Ch. 4 & Ch.5 HW 2 Assigned
4	Trip Generation Regression Models and ITE Trip Generation Book Cross-Classification Models	Ch. 5 Class Notes HW 3 Assigned
5	Trip Distribution Gravity Model Calibration of a Gravity Model	Ch. 5 Class Notes HW 4 Assigned
6	Modal Split (Mode Choice) User Utility Theory Calibration of a Modal Split Model	Ch. 5 Class Notes HW 5 Assigned
7	Midterm Exam	
8	Transportation Network Design Transportation Supply Analysis	Ch. 7. Class Notes HW 6 Assigned
9	Traffic Assignment Network Equilibrium: User Equilibrium and System Optimal	Ch. 5 Class Notes HW 7 Assigned
10	Traffic Impact Studies	Handout HW 8 Assigned
11	Goods Movement (Freight) Planning Land Use Planning and Modeling	Ch. 6 Handouts HW 9 Assigned
12	Final Exam	

Class Weekly Participation

Class participation includes online discussions. Students are expected to participate in weekly online discussions about course material and current topics related to urban transportation planning. Discussions are carried out in an asynchronous manner where students post questions and comments related to the course material, and reply to questions posted by the instructor.

Homework

There will be ten homework assignments following the lectures. Homework assignments must be completed independently by each student. The homework submission will be through Moodle. The due date for each homework assignment will be a week after the homework posting in Moodle (the submission due date and time will be indicated in the homework submission posting).

Exams

There will be a midterm and a final exam. Each exam will be assigned through Moodle and students will have one week to solve the problems and submit the solutions. The submission will be through Moodle. Needless to say, the exams should be completed by each student 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. You must have a very good reason for requesting an extension. You must contact the instructor to get an extension for the submission.

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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