JOHN A. REIF, JR. DEPARTMENT OF
CIVIL AND ENVIRONMENTAL ENGINEERING

NJIT New Jersey Institute of Technology

TRAN 603 – Introduction to Urban Transportation Planning – Summer 2025

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 andtheir 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 transportationdemand.
    - 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	

Course Delivery

This is an online course. The course content and instructor-student interaction will be delivered through Canvas. Lectures are delivered using PDF files and lecture recordings. Lecture material can be discussed asynchronously by posting questions or comments in dedicated discussion forums. Students are strongly encouraged to access the TRAN 603 Canvas website regularly and often throughout the course. This will provide timely access to course materials, announcements, useful links, and discussions.

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 Canvas. The due date for each homework assignment will be a week after the homework posting in Canvas (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 Canvas and students will have one week to solve the problems and submit the solutions. The submission will be through Canvas. 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.

AI statement: The use of artificial intelligence (AI) is permitted in this course only when explicitly stated in assignments. If students use AI for any course-related work, they must cite it according to the guidelines provided on the NJIT Library AI Citation page. If you have any questions about AI use in this course, please contact the course instructor before submitting any assignments. In cases where AI use is not allowed, students are expected to complete work without AI assistance to develop their skills in this subject area.

Makeup Policy

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

Code of Conduct

The NJIT honor code (http://www5.njit.edu/policies/sites/policies/files/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.

CEE Mission, Program Educational Objectives and Student Outcomes

The mission of the Department of Civil and Environmental Engineering is:

•to educate a diverse student body to be employed in the engineering profession
•to encourage research and scholarships among our faculty and students
•to promote service to the engineering profession and society

Program Educational Objectives

Our Program Educational Objectives are reflected in the achievements of our recent alumni:

1. Engineering Practice: Alumni will successfully engage in the ethical practice of civil engineering within industry, government, and private practice, working towards safe, practical, resilient and sustainable solutions in a wide array of technical specialties including construction, environmental, geotechnical, structural, transportation, and water resources.

2. Professional Growth: Alumni will advance their technical and interpersonal skills through professional growth and development activities such as graduate study in engineering, research and development, professional registration and continuing education; some graduates will transition into other professional fields such as academia, business, and law through further education.

3. Service: Alumni will perform service to society and the engineering profession through membership and participation in professional societies, government, educational institutions, civic organizations, charitable giving and other humanitarian endeavors.

Student Outcomes

Our Student Outcomes are what students are expected to know and be able to do by the time of their graduation:

1.an ability to identify, formulate and solve complex engineering problems by applying principles of engineering, science and mathematics
2.an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety and welfare, as well as global, cultural, social, environmental and economic factors
3.an ability to communicate effectively with a range of audiences
4.an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental and societal contexts
5.an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks and meet objectives
6.an ability to develop and conduct appropriate experimentation, analyze and interpret data and use engineering judgment to draw conclusion
7.an ability to acquire and apply new knowledge as needed, using appropriate learning strategies
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