Fall 2023

CE 351-101:Intro To Transportation System

Dejan Besenski

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

NJIT New Jersey Institute of Technology

CE 351 Introduction to Transport System **Fall 2023**
Section 101

Brief Course Description

This course focuses on the fundamental principles of transportation systems, introduces transportation systems components, costs, and addresses how one analyzes them effectively. The fundamentals of operating characteristics of various modes and intermodal combinations (transportation supply) are explained and how customers (e.g., freight shippers, travelers) of transportation services make transportation decisions (transportation demand). Quantitative modeling techniques are explained to analyze and model complex transportation systems.

Prerequisites: CE 200, CE 200A, CE 350 A study of the principal modes of transportation, emphasizing the planning, design, and construction of facilities for modern transportation systems.

Course Objectives

This course has several goals:

- To provide an understanding of how the traveler and freight transportation works and how to think about analyzing and designing transportation systems.
- To provide an understanding of the multi-dimensionality of transportation issues in terms of technology, systems, and institutions.
    - Understand how transportation fits into a broader social/political/economic context involving environmental issues, economic development, sustainability, land use, etc.
- Have the capability to identify and analyze transportation problems.

Instructor Info & Office Hours

Dejan Besenski, Ph.D.
Office: 276 Tiernan Hall | E-mail: besenski@njit.edu | Office Phone: 973-596-5315
Office Hours: Thursday 4:00-6:00PM

Canvas Chat and Discussion Forum can be used to post questions and discuss the course materials and assignments with the instructor and fellow students. Students can also send e-mails to the instructor through Canvas, and call the instructor's office phone number.

Lecture Hours and Location

Thursday, 6:00 PM to 8:50 PM

Textbook:

Joseph Sussman, "Introduction to Transportation Systems", Artech House, Incorporated, ISBN 978-1-1181-2014-9

Grading
Homework: 10%
Midterm Exam: 30%
Final Exam: 30%
Project: 30%

Code of Academic Integrity
Academic Integrity is the cornerstone of higher education and is central to the ideals of this course and the university. Cheating is strictly prohibited and devalues the degree that you are working on. As a member of the NJIT community, it is your responsibility to protect your educational investment by knowing and following the academic code of integrity policy that is found at: http://www5.njit.edu/policies/sites/policies/files/academic-integrity-code.pdf.
Please note that it is the instructors' professional obligation and responsibility to report any academic misconduct to the Dean of Students Office. Any student found in violation of the code by cheating, plagiarizing or using any online software inappropriately will result in disciplinary action. This may include a failing grade of F, and/or suspension or dismissal from the university. If you have any questions about the code of Academic Integrity, please contact the Dean of Students Office at dos@njit.edu.

Exam/Homework Policies

Exam: Students will be given exam problems at the beginning of the examination period and will have a specified amount of time (e.g. 3 hours) to submit the solutions in Canvas.

***Homework*:** Problems will be assigned to reinforce course learning objectives. The assignments will be targeted to provide practice for methods that may be included in course exams. There will be approximately seven homework assignments during the semester. Homework should be turned in at the start of the class period identified by the instructor. No late homework will be accepted. Homework assignments will be posted in Canvas, and students will be expected to submit the solutions through Canvas by the indicated due time.

Collaborating, sharing, and/or copying of exam/homework is **NOT** allowed. Credit will not be given to individuals who either initiated, allowed, or participated in such behaviors. The NJIT honor code will be upheld and any violation will be brought to the immediate attention of the Dean of Students.

Class Polices
Cell Phones and mobile devices (e.g., Laptop, iPad/Tablet PC, iPod, etc.): Cell phones should be turned off prior to coming to class. Texting and the use of mobile devices during the class shall not be allowed. Each student will be excused to miss up to two classes with prior permission/VALID reason. Each subsequent class absence will be reported to the Dean of Students and may affect student's standing and grade. Five (5) or more missed classes may result in an F grade.

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

NJIT New Jersey Institute of Technology

Course Schedule

Week	Topic	Reading	Assignment
1	Course Overview & Introduction: Context, Concepts	Ch. 1/ Supplementary Material	
2	Transportation Systems – Infrastructure/Vehicles/Human	Ch. 2,3/ Supplementary Material	HW#1
3	Traveler Transportation - Urban Transportation, Land-Use, Mobility vs. Accessibility	Ch.21,22	HW#2
4	Urban Transportation Planning Process – Part 1	Ch 25/Supplementary Material	HW#3
5	Urban Transportation Planning Process – Part 2	Ch 25/ Supplementary Material	HW#4
6	Traffic Control and Impact on Mobility	Ch 26/Supplementary Material	HW#5
7	Midterm Exam		
8	Class in the Colton Hall Lab	Supplementary Material	HW#6/Project Assigned
9	Transportation Economics	Supplementary Material	HW#7
10	Transportation Project Evaluation and Finance	Supplementary Material	HW#8
11	Intelligent Transportation System and Freight	Ch. 12 Ch. 13 (pp. 171-179) Ch 20 (pp. 261-273) Ch 24/Supplementary Material	
12	Public Transportation System	Ch.26/Supplementary Material	
13 (24 Nov)	Thanksgiving Recess		
14	Project Presentation		
15	**Final Exam**		

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

NJIT New Jersey Institute of Technology

Course Objectives Matrix -CE 351- Introduction to Transportation Systems

Strategies, Actions and Assignments	ABET Student Outcomes (1-7)	Program Educational Objectives	Assessment Measures
Student Learning Outcome 1: To provide understanding of the multi-dimensionality of transportation issues, in terms of technology, systems and institutions.			
Discuss public transportation facilities.	2, 7	1, 2	Discussions and homework.
Use analytical tools to design transportation facilities.	2, 7	1	Homework, hands-on laboratory exercises, group project, exams.
Implement design of transportation facilities.	2	1, 2	Graded group project.
Link transportation to land use, economics, social planning, and master plans.	2, 4	2, 3	Homework and exams.
Student Learning Outcome 2: To provide an understanding of how the traveler and freight transportation works and how to think about analyzing and designing transportation systems.			
Give examples of growth due to improvement in transportation.	2	2, 3	Discussions, exams, and homework.
Introduce need for forecasting models.	1, 2, 7	1, 2	Homework and exams.
Discuss application of models.	1, 2, 7	1, 2	Homework and exams.
Assign large scale problems.	1, 2, 7	1, 2	Graded group project.
Student Learning Outcome 3: Have the capability to identify and analyze transportation problems.			
Discuss how to obtain data necessary for transportation studies.	7	1, 2	Homework, graded group project
Introduce problems to be solved using analysis tools.	2, 7	1, 2	Homework, group project, exams.

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 scholarship among our faculty and students
- to promote service to the engineering profession and society

Our program educational objectives are reflected in the achievements of our recent alumni:

1 – Engineering Practice: Alumni will successfully engage in the practice of civil engineering within industry, government, and private practice, working toward 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 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 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.

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 conclusions.
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.