IE 530 Logistics and Transportation Systems Planning
Fall 2024-2025

Instructor : Bülent Çatay (FENS 1058)
Office Hour : W 10:00–11:00 or by appointment
Lectures : M 9:40–11:30 (FENS L058)
W 15:40–16:30 (FENS L058)

Objectives:

The objective of the course is to give the students a solid understanding of modeling approaches, analytical tools and techniques that are useful in the design and planning of logistics and transportation systems. The topics include logistics network design, facility location and allocation, long- and short- haul freight transportation, and vehicle routing and scheduling as well as issues related to sustainable mobility. We will discuss the theory, application methods, and techniques that are needed to successfully model, analyze, and solve these problems. We will develop and employ both exact and approximate methods to solve problems arising in logistics and transportation systems, and implement computerized applications. The course is designed for graduate students who have a solid background in mathematical programming. Proficiency in a programming language (C, C++, C#, Java, Python as such) and CPLEX/GUROBI is required, familiarity with (meta)heuristics is strongly recommended.

Recommended Textbooks:

Introduction to Logistics Systems Management. G. Ghiani, G. Laporte and R. Musmanno. John Wiley & Sons, 2013. (eBook available online at the Information Center)

Introduction to Logistics Systems Planning and Control. G. Ghiani, G. Laporte and R. Musmanno. John Wiley & Sons, 2004. [TS161 .G45 2004]

Supply Chain Engineering. M. Goetschalckx. Springer, 2011. [HD38.5 .G586 2011] (eBook available online at the Information Center)

Facilities Design, 5th edition. S. Heragu. CRC Press, 2022. [TS177 .H47 2022] (eBook available online at the Information Center)

Grading Policy:

50% Exam + 20% Presentations + 20% Project + 10% Term Paper

Exam: A single comprehensive exam will be given in class, closed book/notes. A make-up exam will be offered after the final exams period to those who missed the exam and have a medical report provided/approved by the Health Center.

Project: A term project will be conducted individually throughout the semester. The project involves the development and implementation of a methodological/algorithmic approach to solve one of the problems discussed in the course or selected from the relevant literature. The topic will be assigned by the instructor. The implementation will be through a programming language and optimization solver. The outcome of the project will be a short paper, which will be presented in class.

Presentations: Each student will make two presentations throughout the semester. The topic will be determined by the instructor and the content will include technical papers from the relevant literature, subject to the approval of the instructor.

General Outline:

- Short-Haul Freight Transportation: Vehicle Routing and Scheduling
- Logistics Network Design: Facility Location/Allocation
- Long-Haul Freight Transportation: Freight Traffic Assignment and Service Network Design

Disclaimer:

The instructor reserves the right, when necessary, to alter the grading policy, change exam dates, and modify the syllabus and course content. Modifications will be announced in class and at the SUCourse website. Students are responsible for the announced changes.

Academic Integrity:

Student in this course are expected to honor the academic integrity principles according to the SU rules and procedures. Non-compliance to academic integrity principles through plagiarism, using or accomplishing another person's work, and/or submitting previously used work will be penalized severely.