

ISYE 4111 ADVANCED SUPPLY CHAIN LOGISTICS

Supply Chain Engineering concentration depth selective elective

Credit: 3-0-3

Prepared Prof. Anton Kleywegt, Spring 2026

Prerequisite(s): ISyE 3103, ISyE 3133, ISyE3232

Texts:

Students should consult one of the following texts:

Ghiani, G., Laporte, G., and Musmanno, R., *Introduction to Logistics Systems Planning and Control*, Wiley, 2004.

Ghiani, G., Laporte, G., and Musmanno, R., *Introduction to Logistics Systems Management*, Wiley, 2013.

Goetschalckx, M., *Supply Chain Engineering*, 2011.

Catalog Description:

Courses in special topics of timely interest to the profession, conducted by resident or visiting faculty.

Course Description

Objectives of the course are

1. to develop a deeper understanding of logistics systems, including the design and operation of logistics systems;
2. to develop skill in the use of the tools acquired in other courses such as statistics, optimization, and probability models to address logistics problems;
3. to become familiar with some of the issues often encountered in practical logistics problems, and to learn how these problems can be attacked with industrial engineering tools.

Topical Outline

1. Less-than-truckload transportation
 - a. Traveling salesman
 - b. Node routing
 - c. Arc routing
 - d. Inventory routing
2. Terminal design and operations
3. Truckload transportation

4. Network flow applications
5. Logistics network design
6. Four of the following topics, depending on students' preferences:
 - a. Water transportation
 - b. Rail transportation
 - c. Air Transportation
 - d. Forecasting
 - e. Military logistics
 - f. Security in logistics
 - g. Humanitarian logistics
 - h. Disaster management logistics
 - i. International logistics
 - j. Regulation and other legal issues
 - k. Closed-loop supply chains
 - l. Outsourcing
 - m. Procurement and auctions
 - n. Pricing and revenue management

Course Learning Outcomes

At the end of this course, students will be able to:

1. Give clear, precise descriptions of logistics problems.
2. Formulate logistics problems in a framework familiar to industrial engineers, for example, using mathematical programming and probability.
3. Use the tools taught in other courses to analyze and solve logistics problems.
4. Be familiar with logistics issues encountered in practice and with approaches used to deal with complex practical problems.

The Mapping from the Course Outcomes to ABET Student Learning Outcomes

The table below shows the relationship between course outcomes and ABET student learning outcomes. The table has 8 columns. The first column lists the course learning outcomes listed above. The next 7 columns list the abbreviated ABET Student Learning Outcomes. The entry of H in a row with specific course learning outcome and column with specific ABET Student Learning Outcomes indicate the importance of attain this outcome is high and will be assessed.

Course outcome \ Program Outcomes	1. identify, formulate solve engg prob by engg, sci & Math	2. produce solutions consider public health, safety, welfare, global, cultural, social, environ & economic	3 communicate with a range of audience	4 recognize ethical & professional responsibilities, make informed judgement consider resolutions in global, economic, environ and societal context.	5. effective on a team provide leadership, collaborative and inclusive envirm, plan tasks & meet objectives	6. develop and conduct experiment, analyze and interpret data & use engineering judgement to draw conclusions.	7. acquire and apply new knowledge using appropriate learning strategies
1. Give clear, precise descriptions of logistics problems.							
2. Formulate logistics problems in a framework familiar to industrial engineers, for example, using mathematical programming and probability.							H
3. Use the tools taught in other courses to analyze and solve logistics problems.							
4. Be familiar with logistics issues encountered in practice and with approaches used to deal with complex practical problems.							

Evaluation of the important course outcomes

The course outcomes 1, 2, and 3 will be assessed by homework and written assessments and course outcome 4 will be assessed by case studies.