

ISYE 3103 SUPPLY CHAIN MODELING: LOGISTICS

Required for BSIE

Credit: 3-0-3

Coordinators: Profs. Erera, Toriello, Spring 2026

Prerequisite(s): ISyE 3030 and 3133

References

1. Course note set.
2. Goetschalckx, M., (2011), Supply Chain Engineering, Springer, New York, New York.
3. Ghiani, G., Laprote, G., and Musmanno, R (2022), Introduction to Logistics Systems Management: With Microsoft Excel and Python Examples (Wiley Series in Operations Research and Management Science, 3rd Edition)

Catalog Description:

Course focuses on engineering design concepts and optimization models for logistics decision making in three modules: supply chain design, planning and execution, and transportation.

Course Description

This course will teach the student how to successfully complete an engineering design or planning project in order to prepare the student for his capstone design project and for design and planning projects in industry. The target area is the design of industrial logistics systems. Important areas within industrial logistics are transportation, inventory in the supply chain, supply chain network configuration, and integrated supply chains.

Topical coverage

The topical coverage and approximate number of weeks are in the table below.

Topics	Weeks
Supply chain concepts: components, and configurations: processes and facilities, cost and other performance indicators, economies of scale, consolidation and coordination	1.5
Freight transportation systems: transportation costs and rates, networks of transport services, role of minimum cost paths.	1.5

Supply chain inventory management: One-to-one, EOQ, pipeline inventory, mode selection, uncertain demand and periodic review, non-stationary demand, safety stock.	4
Supply chain network management: One-to-many and many-to-many flows, scale economies, uncertainty in network flow modes, time-space network.	3.5
Freight transportation management: multi-stop single vehicle routing and scheduling, multiple vehicles, vehicle fleet management	2
Supply chain network design: facility location models, location-allocation models, inventory considerations in SC network design.	2.5

Outcomes and their relationships to ISyE Program Outcomes

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

1. Structure industrial logistics problems by identifying the objectives, constraints, and decisions variables
2. Design and plan logistic systems by applying the engineering design method
3. Identify major classes of industrial logistics systems and operations and recognize their most significant characteristics
4. Model the basic variants of industrial logistics problems and solve them with basic solution algorithms

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 &
	3 communicate with a range of audience
	4 recognize ethical & professional responsibilities, make informed judgement consider resolutions in global, economic, environ and
	5. effective on a team provide leadership, collaborative and inclusive environ, plan tasks &
	6. develop and conduct experiment, analyze and interpret data & use engineering
	7. acquire and apply new knowledge using appropriate learning strategies

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Evaluation of the important outcomes

The course outcome 2 and 4 can be assessed on targeted final exam questions.