

ISYE 3103 SUPPLY CHAIN MODELING: LOGISTICS

Required for BSIE

Credit: 3-0-3

Coordinators: Profs. Erera, Toriello, Summer 2026

Prerequisite(s): ISyE 3030 and 3133

References

1. Course note set.
2. Goetschalckx, M., (2011), **Supply Chain Engineering**, Springer, New York, New York.

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 Outline

The topical outline is shown in the table below. The table has 2 columns. The first column lists the topics to be covered. The second column lists the number of weeks these topics will be covered.

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

Course Learning 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

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. Structure industrial logistics problems by identifying the objectives, constraints and decision variables							
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4. Model the basic variants of industrial logistics problems and solve them with basic algorithms	H						

Evaluation of the important outcomes

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