

ISYE 4301 Supply Chain Economics

Required for Economics and Financial systems concentration depth

Credit: 3-0-3

Prepared Profs. Wang, Zhou and Ziani, Spring 2026

Prerequisite(s): ISyE 3133, ISyE 3232

Catalog Description:

The course studies techniques for coordination and collaboration in supply chains. Applications include pricing strategies, revenue management, gaming, and incentives.

Course Description

This course introduces students to the principles of microeconomic analysis and game theory applied to decision-making in supply chains. Emphasis will be put on strategic decisions of the suppliers and clients in the supply chain. Topics include supply, demand, competition, collaboration, pricing and revenue management with and without information asymmetries in the context of manufacturing, logistics and service systems.

References:

Lecture notes available on Canvas.

Steven Tadelis, “Game Theory: An Introduction.”

Chen Zhou, “Supply Chain with Economics and Human Needs,” Barnes & Noble, May 2022. You can also get the PDF version for free at Chen Zhou’s website:

<https://sites.gatech.edu/chen-zhou/>.

Topical Outline

This course will discuss the qualitative and quantitative issues in

Topic	Weeks
Review of Microeconomics, utility to supply/demand, revenue management	2
Scale and uncertainty in supply chain: manufacturing, logistics (transportation and inventory) and services	2
Perfect competition, monopoly	1
Game theory in competition: Cournot, Bertrand, differentiation, pricing	3
Collaborations, information asymmetry, contracts, incentives,	3
Incentive contracts and summary	3
Total	14

Course Learning Outcomes

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

1. Apply game theory in competitions in the supply chain context.
2. Apply basic theory in collaboration to strategic decisions in supply chain.
3. Quantify the economic forces in the supply chain, such as scale, scope, uncertainty, sharing, uniformity, and speed.
4. Develop defensible solutions and present results in team assignment.
5. Consider ethical and professional responsibilities in their decisions.

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 attaining this outcome is high and will be assessed.

Course outcome \ Program Outcomes	1. identify, formulate solve engg prob by engg, sci &	2. produce solutions consider public health, safety, welfare, global, cultural, social,	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 envirm, plan tasks & meet objectives	6. develop and conduct experiment, analyze and interpret data & use engineering judgement to	7. acquire and apply new knowledge using appropriate learning strategies
1. Apply game theory in competition SC							
2. Apply game theory collaboration							
3. Quantify the economies forces							
4. Develop plausible solutions and present results in team assignment		H			H		
5. Consider ethical and professional responsibilities.				H			

Evaluation of the important course outcomes

The course outcomes 5 and 6 assessed by project and final exam questions, and team assignment.