ISYE 4301 Supply Chain Economics

Required for Economics and Financial systems concentration depth

Credit: 3-0-3

Prepared Profs. Wang, Zhou and Ziani, 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 and their relationships to Program 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 defendable solutions and present results in team assignment.
5. Consider ethical and professional responsibilities in their decisions.

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 envirn, 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.