

IE 546
Competitive Models in Supply Chain Management

Spring 2009

IE 546 Competitive Models in Supply Chain Management: Centralized and decentralized analysis of production and distribution systems; existence and uniqueness of equilibrium in principal agent and simultaneous move games; contract design; information asymmetry, Bayesian games; cooperative games; dynamic games.

This course is offered to graduate students and senior undergraduates as a *regular course*. Recent interest in supply chain management (SCM) raised interesting new problems for IE/OR. Analysis of problems with Inventory, service and price considerations introduce new challenges. The objective is to explore state of the art research decentralized analysis of supply chain management problems.

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Course schedule: TTW 782 M 2200 M 2200 M 1170

Course Web Page: <http://karagoz.ie.boun.edu.tr/moodle/> follow "IE Elective"

Prerequisite: Knowledge of basic optimization and probability.

Course outline:

Topic	Week
Introduction	1
Basic supplier-buyer relation (quantity)	2-3
Supplier-Buyer relation (price)	4
Game theoretic concepts	5-6
Retailers' competition on quantity	5
Multi-period, multi-stage models	6-7
Asymmetric Information	8-9
Models with options	10-11
Models with random yield and random demand	12
Stochastic games under substitutable demand	13
Cooperative models	14

Grading: Class participation, 3 assignments, a term project and a final examination will make up your total grade.

Textbook: There is no textbook for this course. Material will be distributed during the course over the web. A primary source is:

Cachon, G. "Supply Chain Coordination with Contracts", in Graves, S. and de Kok, T. (Eds.) *Handbooks in Operations Research and Management Science: Supply Chain Management*, North-Holland, 2003.