

B8108: Supply Chain Management for MSE

Spring 2016

Class schedule: Tuesdays & Thursdays; 2:40-3:55 PM

Location: 627 Mudd Hall

Instructor: Awi Federgruen
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Tel: 212-854-6084
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Instructor office hours: Tuesdays & Thursdays
4-5 pm, and by appointment.

TA: Ms Yeqiing Zhou
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TA office hours: TBA

This course covers the major issues in supply chain management, including the definition of supply chain, planning models to guide the design of a supply chain network, the role of inventories in make to stock systems, commonly used inventory models, supply contracts, the value of information and information sharing, risk pooling, design for postponement, managing product variety, information technology and supply chain management; international and environmental issues.

Prerequisites:

- IEOR 3402, IEOR 4000 or permission of instructor
- Students are expected to have a working knowledge of optimization, spreadsheet-based simulation, probability, and EXCEL.

Required Textbook: David Simchi-Levi et al., *Designing and Managing the Supply Chain: Concepts, Strategies, and Test Studies*. 3rd edition, McGraw-Hill, 2008.

Readings & Cases (available on Courseworks website):

- CEMEX: Transforming a Basic Industry Company
- Fast, Global, and Entrepreneurial: Supply Chain Management, Hong Kong Style (An interview with Victor Fung)
- Multimarket Facility Network Design with Offshoring Applications
- Queuing Management and Models
- Dynamic Lot Sizing with Deterministic Demand, Principles of Inventory Management

Recommended References:

- Jeremy F. Schapiro, *Modeling the Supply Chain*. Duxbury, 2001.
- Terry P. Harrison et al., eds., *The Practice of Supply Chain Management: Where Theory and Application Converge*. Kluwer Academic Publishers, 2003.
- Sunil Chopra and Peter Meindl, *Supply Chain Management: Strategy, Planning, and Operation*. 2nd edition, Pearson Prentice Hall, 2004.
- Gérard Cachon and Christian Terwiesch, *Matching Supply with Demand: An Introduction to Operations Management*. McGraw Hill, 2009.
- Robert E. Hall, *Digital Dealing: How E-Markets are Transforming the Economy*. W.W. Norton & Company, 2001.
- A.G. de Kok and S.C. Graves. Eds., *Supply Chain Management: Design, Coordination, and Operation*. Elsevier, 2003.

Game Assignment: Write-up Littlefield game (group assignment), due March 1 (5% grade)

Problem Assignments (You must turn in at least 6; you will be credited for the best 6 grades):

1. Problem set 1: Deterministic continuous review models, due Feb 2
2. Problem set 2: Single period stochastic inventory problems, due Feb 9
3. Problem set 3: Sports Obermeyer analysis, due Feb 11
4. Problem set 4: Make to order systems, due Feb 23
5. Problem set 5: Supply contracts, due March 8
6. Problem set 6: Multi-period stochastic inventory models, due March 24
7. Problem set 7: Multi-period non-stationary models, due March 31
8. Problem set 8: Inventory pooling, due April 12
9. Problem set 9: Network design problems, due April 26

Grading:	Problem Sets	30%
	Final Exam	30%
	Midterm Exam	25%
	Littlefield game write-up (group assignment)	5%
	Participation	10%

Participation: For this course to be successful, everyone must participate in classroom discussion. The participation grade is based on the instructor's evaluation of the quality of each student's progress and contribution during the semester. You should note that, in general, *quality* is more important than *quantity*.

Make-Up Exams: The instructor requires written documentation of the student's reason for missing the exam, as well as notification prior to the scheduled exam. If the instructor decides that the reason for the absence is valid, the student will be scheduled for the make-up exam.

Re-Grading: If you feel that your performance has been under-evaluated, please resubmit your work, along with a *written* statement directly to the course instructor, within seven days after receiving your grades, explaining clearly why you feel that your grade should be adjusted.

Tentative schedule:

- Jan 19:** Introduction to Supply Chain Management
- Jan 21:** A badly performing supply chain: pharmaceuticals/vaccines
- Jan 26:** Introduction to inventory management and supply management: Deterministic Continuous Review models
- Jan 28:** Deterministic Continuous review Models II: supply chain coordination mechanisms
- Feb 2-4:** Managing Demand risks; Supply Contracts (Single sales season models)
- Feb 9:** Supply contracts: Buyback agreements, revenue sharing, discount schemes
- Feb 11:** The benefits of reactive capacity: Sports Obermeyer case
- Feb 16:** Make to Order systems I: queueing models
- Feb 18:** Make to Order Systems II: introduction to Littlefield Game
- Feb 23:** Multi-period inventory systems: linear procurement costs
- Feb 25:** Multi-period inventory models: economies of scale in procurement costs
- March 1:** Littlefield supply chain game: discussion and analysis
- March 3:** Forecasting in supply chain management
- March 8:** Serial supply chains and the bull whip effect: **an in-class Beer Game (double session 2:40 PM-5:10 PM)**
- March 10:** No class
- Friday, March 11:** **Midterm (9:30AM -11:30AM)**
- March 15-17:** **SPRING BREAK**
- March 22:** : The value of information and information sharing: discussion of the Beer game and Barilla Spa case
- March 24:** No clas
- March 29:** Inventory pooling and supply chain integration; two echelon inventory systems
- March 31:** Inventory pooling and supply chain integration; two echelon inventory systems II
- April 5:** Supply chain design; design for postponement: the HP Deskjet case
- April 7: China- Mexico dual sourcing game
- April 12:** Dynamic Capacity Sizing

April 14: Global sourcing; outsourcing;

April 19-21: Supply chain network design models; Chobani case

April 26: (longer session: 2:40 PM-5:10 PM) guest lecture by Prof. Medini Singh: Role of IT in Supply Chain Transformation; Virtual Integration; Value Chain Dissection

TBD: Final exam

Readings:

Jan 21: Chapter 1

Jan 26-28: Chapter 2, pp.27-35

Feb 2-4: Chapter 2, pp.35-41, Chapter 4, pp. 123-125

Feb 11: Chapter 2, pp. 63-77

Feb 16: Queueing Models and management (posted)

Feb 23: Chapter 2, pp.45-48, 56-60

Feb 25: Multi-period inventory models: economies of scale in procurement costs; multi-period inventory models with non-stationary parameters: handout (posted)

Mar 1: Littlefield supply chain game: discussion and analysis

Mar 8: Chapter 5, pp.143-161

Friday, March 11: midterm

March 15-17 : SPRING BREAK

March 22 : Chapter 5, pp.161-171

March 29: Chapter 6

April 5-7: Chapter 11

April 12-14 Chapter 3, pp.77-94.

April 19: Lu & van Mieghem, MSOM vol.11 (2009)

April 21: Chapter 10

TBD: Final Exam.