IEMS 381: Supply Chain Modeling and Analysis
Fall 2006

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	Office: Tech M233
	Office Hours: W 4–5, F 2–3, and by appointment.
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Class Time and Location:	MWF 10:00-10:50 (Tech LR4)

Course Description

This course will provide an introduction to modeling and solution methods for facility location, transportation and inventory management decisions that arise in supply chain analysis.

Learning Objectives

1. To introduce students to the development of mathematical modeling and solution tools for supply chain management;
2. To teach students to use these tools to analyze strategic, tactical, and operational supply-chain decisions including facility location, vehicle routing, and inventory management; and,
3. To engage students in case studies based on real world supply chain decisions.

Prerequisites

IEMS 313 or IEMS 310: Students should be familiar with linear programming, including formulating primal and dual linear programming problems, complimentary slackness conditions, and interpretation of the dual problem and variables. Students should be familiar with techniques for solving specialized problems like the shortest path problem and the transportation problem

Course Materials

Course reader, available at CopyCat.

Recommended text: Chopra, S. and P. Meindl, *Supply Chain Management: Strategy Planning and Operation*, Prentice Hall, Upper Saddle River, NJ, 2006 (3rd edition).

Other reference texts:
Daskin, M. S., *Network and Discrete Location: Models, Algorithms and Applications*, John Wiley and Sons, Inc., New York, 1995.
Fourer, R., Gay, D. M. and B. W. Kernighan, *AMPL: A Modeling Language for Mathematical Programming*, The Scientific Press, South San Francisco, CA, 2002.
Nahmias, S., *Production and Operations Management*, Third Edition, Irwin, Chicago, 1997.
Simchi-Levi, D., Kaminsky, P., and E. Simchi-Levi, *Designing and Managing the Supply Chain: Concepts, Strategies, and Case Studies*, Irwin McGraw Hill, Boston, MA, 2002.

Course Assessment

There will be approximately 5 problem sets, 4 case studies, a midterm, and a final exam.

1. Problem sets (15%).
2. Midterm (25%).
3. Final exam (35%).
4. Case studies (20%).
5. Participation (5%). Students are expected to prepare for and actively participate in class discussions.

Homework Policy

A due date will be specified on each assignment. Late assignments will not be accepted, except in the most extraordinary circumstances and then only with my prior permission. Problem sets should NOT be submitted through Blackboard unless otherwise noted.

Homework assignments are NOT group projects. If it is clear that you have not completed the assignment on your own, you will not receive credit. In some cases, you may ask your peers for help, in which case you must acknowledge this help in your assignment, "'I thank XXX for helping me solve this problem." Failure to follow this model will result in a loss of credit for the assignment.

Course outline

Week	*Date*	*Topic*	*Reading*
1	9/20	Course introduction: administrative matters, overview of supply chain management;	Chapters 1-3
2	9/25	Facility location: overview of models; covering models; center and median models	Chapters 4-5
3	10/2	Facility location: fixed charge problems	
4	10/9	Facility location: integrated models	
5	10/16	Transportation: overview of models	Chapter 13
6	10/23	Transportation: traveling salesman problem; formulation and solution methods	
	10/27	MIDTERM	
7	10/30	Transportation: vehicle routing; formulation and solution methods	
8	11/6	Transportation: vehicle routing, cont.	
9	11/13	Inventory: lot sizing; multiple products; quantity discounts	Chapter 10
10	11/20	Inventory: uncertainty	Chapters 11-12
11	11/27	Supply chain coordination; the bullwhip effect	Chapter 17
	12/6	FINAL EXAM: 9am-11am	

There will be weekly discussion sessions covering issues related to the course, problem sets and case studies.