



SOM 821 - Management Science I Fall 2009

Class Time: Tuesdays: 12:00-2:30PM
Room: ISOM Room 128

Instructor: Dr. Anna Nagurney
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Office Hours: Mondays: 10:30-11:30AM; Wednesdays: 10:00-11:00AM,
and by appointment

Course Description:

This course is an introduction to the basic theory underlying Management Science and Operations Research. It focuses on linear programming, the fundamental concepts, and algorithms. Applications drawn from different functional areas of business will also be presented. In particular, the course will cover a variety of applications of management science in the areas of finance, marketing, and production such as capital budgeting, optimal sales allocation, and scheduling and distribution. Special cases of linear programming problems, such as the transportation problem and assignment problems will also be studied.

The intent of this course is not only to cover the basic topics, but also to prepare the students for conducting research.

Required Textbook: Linear Programming and Network Flows, third edition,
M. S. Bazaraa, John J. Jarvis, and H. D. Sherali, 2004.

Outline of Topics to be Covered

- 1. Introduction Evolution of Management Science and the Modeling Process**
- 2. Linear Programming Introduction Graphical Method**
- 3. Some Applications of Linear Programming**
- 4. Theoretical Background Extreme Points and Basic Feasible Solutions**
- 5. Representations and Pivoting -- the Simplex Method**

- 6. Duality and Complementary Slackness**
- 7. Basic Sensitivity Analysis**
- 8. The Dual Simplex Method**
- 9. Integer Programming and Applications**
- 10. The Hitchcock Transportation Problem Initiation Techniques Balanced and Unbalanced Transportation Problems The MODI Method**
- 11. The Assignment Problem Balanced and Unbalanced Transportation Problems The Hungarian Method**
- 12. Network Models and Applications**
- 13. Network Project Planning Techniques The Critical Path Method (CPM) Project Evaluation and Review Technique (PERT)**

Copies of the lecture notes will be distributed in class.

Requirements

There will be homework assignments given regularly throughout the class. In addition, there will be a midterm and final examination. The students will also be required to give an in class presentation on a research paper.

Grading Policy

Homework:	25%
Midterm Exam:	30%
Final Exam:	30%
Paper Presentation:	15%