



## **MGS 8140 – Management Science Spring, 2011 Course Syllabus - Jim Shi**

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Class CRN: 15818, Section: 005  
Instructor: Junmin (Jim) Shi  
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Classroom: Aderhold Learning Center 331  
Meeting time: 4:30 – 7:00PM, Monday  
Credit hours: 3.0  
Class Website: [myRobinson.gsu.edu](http://myRobinson.gsu.edu)  
(Note: E-mail is the best form of contact; please start subject with "MGT 8140")

### **Course Overview**

This course covers many approaches to solving business problems from managerial point of view. Various optimization techniques are surveyed with an emphasis on the why and how of these types of models as opposed to a detailed theoretical approach. Students develop optimization models which relate to their areas of interest. Spreadsheets are used extensively to accomplish the mathematical manipulations. Emphasis is placed on input requirements and interpretation of results.

### **Prerequisites:**

CSP: 1,3,4,7. It also requires a good background with Excel Spreadsheet.  
You must meet these prerequisites and the course will be taught assuming you have sound background in those topics.

### **Text:**

An Introduction to Management Science, 13th Edition, South-Western (August 18, 2010), by Anderson, Sweeney, Williams, Camm and Martin;  
(ISBN-13: 978-1-4390-4327-1; ISBN-10: 1-4390-4327-2).

### **Cognitive Objectives:**

To receive a grade of "A", you should develop theoretical knowledge, modeling know-how, and computer skills and be able to:

- Understand and explain in your own words ways in which model-based support systems are needed and can be utilized in managerial decision processes.
- Explain how and why modeling is used in the support system environment.
- Identify and differentiate different model components.

- Understand and explain the modeling process and be able to apply it in a variety of different business situations.
- Compare and contrast different decision structuring techniques and to use these techniques to analyze various situations.
- Evaluate models applying good modeling and validation techniques.
- Implement model-based management solution using Excel.
- Develop and demonstrate presentation skills and be able to post reports to the manager.
- Use Internet (e.g., Web) and its tools to access necessary information for model development.

**General Course Objectives:**

To demonstrate the application of models in support of managerial decision making in an enterprise, using some of the most commonly used modeling approaches and principles. Upon completion of the course, the student should:

- Demonstrate competence in analysis/development of some common models analytically
- Demonstrate competence in analysis/development of some common models graphically
- Demonstrate competence in using a spreadsheet for management purposes
- Interpret model results in the context of the business situation and explain in plain language

**Attendance/Class Participation/Homework:**

Your class participation grade will be based on attendance only. All homework assignments will be reviewed in class, but homework will not be collected. You are expected to attend classes. Class attendance will be taken in the beginning of class. If you do miss a class, you are responsible for obtaining notes and remaining current. It is not possible to repeat lectures for students missing class. Two “free” absence is allowed. There are no “excused absences.”

Late students are responsible for signing the class roll before leaving. Otherwise, you will be considered absent. Excessively late students and students leaving early will be penalized. If you arrive late, it is **your** responsibility to remember to sign the roll before you leave.

**All pagers and cell phones should be turned off or muted during class.**

**Course Policies:**

- All projects and assignments are subject to grade penalty if not turned in at the beginning of class on the due date.
- The internet will be used extensively for communications throughout the semester. You are expected to become proficient using e-mail and web-publishing skills. It will be your responsibility to read your mail on a regular basis. The three-fold purpose is to familiarize you with online capabilities, to facilitate communication with other class members and me, and to reduce paper usage in a green manner.
- Class attendance is expected and a necessary component of class participation.
- Assignments remain due on the designated date regardless of class attendance. This is a project-oriented class using various computer application programs, which require significant time commitment.

## Grading

Details will be made available in class and the course site. You are expected to make your reports available on your website on the due date.

Homework 1	10%
Homework 2	10%
Exam 1	20%
Exam 2	20%
Project	30%
Class Participation	10%

The grading scale for this class is as follows: A+: 97-100; A: 94-96; A<sup>-</sup>: 90-93.9; B+: 86-89.9; B: 82-85.9; B<sup>-</sup>: 78-81.9; C<sup>+</sup>: 74-77.9; C: 70-73.9; C<sup>-</sup>: 66- 69.9; D: 60.0 - 65.9; F:< 60.0

Professional and personal circumstances that preclude you from performing at satisfactory levels will not be considered in the determination of the course grade. The effect of your grade on overall GPA, eligibility for graduation, loss of scholarship, loss of a United States resident card, placement on academic probation, etc., are *not* considered in the determination of your grade. There are no extra credit assignments. Individual requests for alternative ways to improve your course grade will not be considered.

## Honor Code:

Plagiarism in any form is not acceptable. While discussion with classmates regarding homework and projects is encouraged, all work submitted must be your own. Evidence of plagiarism on an assignment/exam will result in a failing grade for that assignment/exam.

## Examinations:

Tests will be administered according to the attached schedule. Tests may be a mixture of multiple choice and calculation problems. Class tests and the common final will test both your understanding of concepts and problem solving ability, and will also include questions about the use of Excel to solve problems in this course.

For in-class tests and the common final exam, you will need to bring a basic calculator (with a square root button!) and *one* 8.5"x11" page of notes (two-sided). Students are required to provide their own pencils and scratch paper. All material needed for tests and the final exam will be covered in class. All students are required to take the final exam.

## Individual Student Projects:

Individual class projects will be discussed in class. These are *not* group projects! Projects are to be submitted on paper by each student by the designated date, including data output and formulas. No diskettes will be accepted, as they are easily misplaced and damaged. *Late projects will be penalized at a rate of 5% per calendar day.* In addition, once the deadline has passed, no further feedback will be given. Use the "fit to one page" option to print your output on 8.5x11" sheets. No report covers, please! Students submitting spreadsheets that are not unique will receive **a zero grade** for the project! You may discuss projects with your classmates, but the work you turn in **must be your own!**

## PowerPoint Slides:

Copies of the PowerPoint slides for this course can be found on the website of this course at myRobinson. To minimize note taking, you should print the slides for each class in advance and bring them to class.

**Tentative Schedule: deviations may be necessary**  
(Supplementary assignments will be added as the course progresses)

<b>Week and Date (Monday)</b>	<b>Topic</b>	<b>Detailed Outline</b>	<b>Chapter</b>	<b>Assignments</b>
1. Jan. 10	Introduction to MS	Course introduction and overview; Problem Solving and Decision Making Quantitative Analysis Models of Cost, Revenue and Profit Management Science Techniques	Syllabus Chapter 1	
2. Jan. 17	No class	<b>MLK holiday</b>		
3. Jan. 24	Spreadsheet Techniques	Effective use of spreadsheets for modeling; Review of key Excel functions; Some Examples	Appendix A	<b>Homework 1 Assigned</b>
4. Jan. 31	An Introduction to Linear Programming	A simple Maximization Problem Graphical Solution Extrem Points and the Optimal Solution A simple Minimization Problem Special Cases	Chapter 2	
5. Feb. 7	Linear Programming:	Sensitivity Analysis Interpretation of Solution	Chapter 3	Homework 1 Due
5. Feb. 14	Exam 1			
6. Feb. 21	Go over Exam 1 Linear Programming Applications	Marketing Applications, Financial Applications Operations Management Applications	Chapter 4	Feb. 25 is the last day to withdraw
7. Feb. 28	No class,	<b>Spring break</b>		Spring Break, Feb. 28- Mar. 6
8. Mar. 7	Advanced Linear Programming Applications	Data Envelopment Analysis Revenue Management Portfolio Models and Asset Allocation	Chapter 5	
9. Mar. 14	Distribution and Network Models	Transportation Models Assignment Models Minimum Cost Network Flow Models Shortest Path Models	Chapter 6	<b>Homework 2 Assigned</b>
10. Mar. 21	Integer Linear Programming	Types of Integer Linear Programming Models Graphical and Computer Solutions for an All ILP Applications Involving 0-1 Variables	Chapter 7	
11. Mar. 28	Exam 2			
12. Apr. 4	Go over Exam 2  Nonlinear Optimization Models	Basic Ideas of Nonlinear Optimization Pricing Models Advertising Response and Selection Models A Production Application Facility Location Models Markowitz Portfolio Optimization Models	Chapter 8	
13. Apr. 11	Project Scheduling: PERT/CPM	Project Scheduling with Known Activity Times Project Scheduling with Unknown Activity Times Time-Cost Trade-Offs	Chapter 9	<b>Homework 2 Due</b>
14. Apr. 18	Inventory Models	Economic Order Quantity Model Economic Production Lot Size Model Single-Period Inventory Model with Probabilistic Demand Order-Quantity, Reorder Point Model with Probabilistic Demand	Chapter 10	
15. Apr. 25	Simulation Modeling	Real Applications of Simulation Probability Distributions for Input Variables The Effects of Input Distributions on Results Operations Models Financial Models Simulating Games of Chance	Chapter 12	