

OM337-2 Supply Chain Modeling and Optimization, Fall 2011
Unique Number: 04175

Meeting Time and Location:

Mondays and Wednesdays, 3:30-5:00 PM, UTC 1.102 or MODLab (see class schedule).

Professor: Annabelle Qi Feng

Office Hours: **Mondays and Wednesdays 5:00 – 6:00PM**

Office Location: CBA 3.436; Mailbox Location: CBA 5.202.

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Teaching Assistant: TBD

Office Hours:

Office Location: ; Mailbox Location: CBA 5.202.

Contact Information:

Course Description

Many managerial decisions – regardless of their functional orientation – are increasingly based on analysis using *quantitative* models from the discipline of management science. Management science tools, techniques and concepts (e.g., data, models, and software systems) have dramatically changed the way business operates in manufacturing, service operations, marketing and finance. This subject is designed to introduce students to the various ways of modeling, or thinking structurally about, decision problems in order to enhance decision-making skills.

It is impossible to teach you all there is to know about management science techniques in a one semester course; rather, our goal is to enable you to become *intelligent users* of management science techniques. In that vein, emphasis will be placed on *how, what* and *why* certain techniques and tools are useful, and what their ramifications would be when used in practice, all in concert with the overarching goal for you to become excellent managers. This will necessitate some mechanical manipulations of formulas and data, but it is not our goal for you to become adept handlers of mathematical equations and computer software.

Course Objectives:

- To enable the students to find some structured ways of dealing with complex managerial decision problems.
- To introduce students to simple decision models and management science ideas that provide powerful and (often surprising) qualitative insights about a large spectrum of managerial problems.
- To provide students with tools for deciding when and which decision models to use for the specific problems.
- To give the students a feel for the kinds of problems that can be tackled using spreadsheet modeling and decision analysis.
- To provide the students with more powerful ways of using spreadsheets, this will be a ubiquitous tool in their managerial careers.

Who Should Take the Course?

The course is particularly recommended to those interested in a career in management consulting, supply chain management, operations and logistics, electronic market design, and corporate finance. The main topics include optimization, decision making under uncertainty and simulation. The emphasis is on models that are widely used in diverse industries and functional areas with added emphasis on supply chain management.

Course Materials:

- Suggested text: Albright and Winston. *Spreadsheet Modeling and Applications: Essentials of Practical Management Science*.
- Lecture notes, homework problems, practice problems, solutions, and other supplemental materials will be posted on Blackboard.

Course Website:

All course materials available in electronic format will be posted at Blackboard course web site (see <http://courses.utexas.edu>).

- Lecture notes will be posted before class.
- Solutions of practice problems will be posted one week after they are assigned.
- Homework problems will be posted one week before they are assigned.
- Instructions for group assignments will be posted one week before they are assigned.

- Spreadsheet solutions for cases and individual homework will NOT be posted. Instead, a word document summarizing the solution will be posted one day after the individual homework is due.
- If you have problems accessing the materials on Blackboard, please email the professor.

Evaluation:

Quiz 1-5	40%
Final Exam	30%
Individual Homework	15%
Group Assignment	10%
Class Participation	5%

Exams:

- There will be five non-comprehensive in-class quizzes. They will be held at MOD lab. The final exam is comprehensive and take-home. The exam questions will be available on Blackboard at 5PM, 11/30. You will be given one-week to complete and return the exam (at 6PM, 12/06).
- No makeup exams unless appropriate paperwork is provided for rescheduling.

Individual Homework: Skill-building exercises will be assigned throughout the semester.

- Individual homework problems and due dates will be posted under "Assignment" on Blackboard. You can also find the due dates on the Tentative Class Schedule below.
- Each homework assignment must be submitted no later than 3:30PM on its due day. NO LATE HOMEWORK WILL BE ACCEPTED. A grade of zero will be assigned if you do not turn in the homework.
- For each homework problem you should submit a Word document to provide your answers to the question as well as an Excel document to support your answers.
- Answers to homework problems should be submitted through Blackboard. *Please make sure that your submission is successful.* No credit will be given to unsuccessful or incomplete submissions.
- Each problem is graded on a 10 point scale. You may drop the lowest problem grades if you submit ALL homework problems.
- You can discuss the homework with your group mates. However, an **individual** write-up of the solution method and recommendations should be submitted. Since solutions are in electronic format, credits will not be given if the same solution is submitted by different students.
- The first individual homework is a survey, the grade for which will be assigned before the last day of class.

Group Assignments: Four case studies will be completed in self-selected groups of four to five people. These assignments will apply the concepts introduced in class to “Real-World” problems.

- Please form your groups as soon as possible and email the information to the TA (see the email address above). The groups should be formed no later than the third day of class.
- Instructions for group assignments and due dates will be posted under “Assignment” on Blackboard. You can also find the due dates on the Tentative Class Schedule below.
- For group assignment, a single grade is assigned to each group.
- You need to turn in just *one solution per group* under “Assignment” on blackboard. No LATE CASE ASSIGNMENTS WILL BE ACCEPTED.
- Please make sure that your submission is successful. No credit will be given to unsuccessful or incomplete submissions.
- Solutions to case assignments will not be distributed. Instead, instructions will be posted on Blackboard when the case is assigned.

Class Participation: Regular attendance at all class meetings is expected. You will be assigned five points for your participation grade.

- Make sure you check the location (lab or classroom) before coming to the class. If you are *not* a business school student, please make sure that you obtain an ID to access the lab computer before the first lab section.
- Name cards will be used to track attendance (from September 7). It is your responsibility to pick up your name card before the class and return it back to me after class.
- Prepare before class and will be called to answer questions in class. Actively participate and follow the instructions for in-class exercises and lectures.
- Be on time! Not disrupting classmates, no surfing the net, reading newspapers, ringing phones, talking, sleeping or working on assignments due in another course.

Regrade Requests: If you wish a regrade of any homework assignment or exam, please appeal it within SEVEN CALENDAR DAYS of:

- For the tests and homework assignments, the date that I attempt to return it to you in class. Please check your grade on Blackboard regularly and any discrepancies to me immediately.
- For the final exam, the first class day of the semester immediately following your course.

After these seven days, I will consider all grades final. Please realize that there are standard policies for point deductions for each problem with any exam or assignment, so unless the grader has misapprehended your intent or misread your work, any partial credit is unlikely to change.

Tentative Class Schedule: (I reserve the rights for possible changes)

	Date	*	Topic	Reading	Assignments	Due date
0	W	08/24	C	Introduction to the course Model vs. modeling	L00 Survey ExcelTutorial (on Bb)	

	Date	*	Topic	Reading	Assignments	Due date
					Form a team of 4/5	
1	M	08/29	L Basics of Spreadsheet modeling Use of range names, Data table • Great Threads: breakeven • Acron: NPV Installing Solver and Solver Table	L01 Chapter 1, 2.1-2.4	HW: Broadway Play ExcelTutorial (on Bb)	HW: Survey
2	W	08/31	L Simple Spreadsheet models Modeling and interpretations • Sam's: quantity discount • Microsoft: promotion	L02 Chapter 2.5-2.6	HW: EOQ Practice: 2.18, 2.26, 2.28	
	M	09/05	Labor Day			
3	W	09/7	C Introduction to optimizations Three steps of problem formulation Sensitivity analysis		HW: Bionic Eye	HW: Broadway Play Form a team of 4/5
4	M	09/12	L Implementing basic optimization models in spreadsheet Curve fitting • Fire station location • Individual vs. social decisions	L04 Chapter 7.1-7.3, 7.5	HW: Pricing Strategy HW: Agency Theory Practice: 7.24-26, 7.55	HW: EOQ HW: Bionic Eye
5	W	09/14	L Quiz 1			
6	M	09/19	L Introduction to LP Use of Solver and Solver Table • Extreme Downhill: production plan	L06 Chapter 3.1-3.3	Practice: 3.26, 3.34, 3.42 HW: Shelby Shelving	HW: Pricing Strategy HW: Agency Theory
7	W	09/21	L Sensitivity analysis • Fiber production • Product mix	L07 Chapter 3.6, 3.8, 4.3	Practice: 4.40, 4.43, 4.45 Group: Amarco	
8	M	09/26	L LP multi-period model • IRS: staffing Issue of unbounded problem • Arbitrage value	L08 Chapter 3.4,3.5,3.7	Practice:3.52, 3.56, 3.58 HW: Diet problem	HW: Shelby Shelving
9	W	9/28	L LP multi-period model and the issues/tricks on nonsmoothness • Aggregate planning	L09 Chapter 4.4	Practice: 4.90, 4.92, 4.94	
10	M	10/3	L Quiz 2			HW: Diet problem
11	W	10/5	C Network representation Max flow problem Min cost flow problem	L11 Chapter 5.1-5.5	Practice: 5.1-5.3 Group: Money in Motion	Group: Amarco

	Date	*	Topic	Reading	Assignments	Due date
			Shortest path network • Gran Mix: transportation		HW: Transportation	
12	M	10/10	L	Duality and min cut problem • HP: product proliferation	L12 HW: Dance partner	HW: Transportation
13	W	10/12	L	Application of min cost flow problem • Cash management	L13 Practice: 5.4-5.5 HW: Bid contract	
14	M	10/17	L	Complex network Transformation of shortest path • Smart Equipment: modular design	L14 Practice: 5.23-5.27 HW: Modular design	HW: Dance partner HW: Bid contract
15	W	10/19	L	Quiz 3		
16	M	10/24	L	Network work model to project management – scheduling and crashing • Building a house	L16 Chapter 5.6 Practice: 5.39-5.42 HW: Audit process	HW: Modular design
17	W	10/26	L	Introduction to integer program Decision involving fixed cost • Great Threads: fix cost production	L17 Chapter 6.1-6.2 Practice: 6.13-15, 6.30-32, 6.41, 6.54, 6.61 Group: GMC HW: Glue production	Group: Money in Motion
18	M	10/31	L	Big M method Distance function Use of binary variables • Hospital location	L18 Chapter 6.4 Practice: 6.69, 6.70 HW: Call center Group: Super Grain	HW: Audit process HW: Glue production
19	W	11/02	L	Logistics network design • Southern Brewery	L19 Case: Southern Brewery	
21	M	11/07	C	Decision criteria, payoff table Decision tree and notation • Techware: new product introduction	L21 Chapter 8.1-8.2 Practice: 8.4-7	HW: Call center Group: GMC
22	W	11/09	L	Introduction to PrecisionTree Risk profile, tornado diagram, sensitivity charts • SciTools: contract bidding • Natural gas exploration	L22 Chapter 8.3 Practice : 8.15-17 HW: Basketball	
20*	M	11/14		Quiz 4 (Takehome 2 hrs, 11/7-15).		

	Date	*	Topic	Reading	Assignments	Due date	
23	W	11/16	L	Multistage decision problem Bayes' rule • Sunny day, rainy day	L23 Chapter 8.5	Practice: 8.18-20, 8.21, 8.23, 8.55 HW: Coin guess HW: Extended Credit	Group: Super Grain
24	M	11/21	L	Introduction to @ Risk Basic elements of simulation Review of probability distributions • Chuck a luck	L24 Chapter 9.1-9.4	Practice: 9.1, 9.2, 9.3, 9.4, 9.5	HW: Basketball HW: Coin guess
25	W	11/23	L	Quiz 5 (Online 2hrs, 11/18-24)			
				Thursday-Saturday Thanksgiving holidays			
26	M	11/28	L	Simulate alternative decision • Overbooking	L26 Chapter 9.5-9.6	Practice : 9.20, 9.26, 9.28, 9.36, 9.47	HW: Extended Credit
27	W	11/30	C	Wrap up Handout final exam questions (due on 12/6 @ 6PM)			
	F	12/02		Last class day			

***Location for the class: L- MOD Lab West (CBA5.325). C - Class room in UTC.**

File name system of course materials

- Each lecture is named LXX.ppt. For example, the lecture on day 24 (11/22) is L24.ppt.
- The examples in lecture are named LXX_EXX_Name.ppt. For example, L24_E01_ChuckALuck.xls is the first example in lecture 24.
- Files for practical problems are named ASXXPXX. For example, AS02P18_Shell.xls and AS02P18_Solution.xls are the shell and solution for practical problem 2.18 from the text, respectively. These problems are for practice only. You do not need to submit your answers.
- The files for homework assignments are named HW_Name. For example, HW_Shelby.doc is the problem description and HW_Shelby_shell.xls is the shell.
- The files for case are named Case_Name. For example, Case_GMC.doc is the case description.

Scholastic Dishonesty

The McCombs School of Business has no tolerance for acts of scholastic dishonesty. The responsibilities of both students and faculty with regard to scholastic dishonesty are described in detail in the Policy Statement on Scholastic Dishonesty for the McCombs School of Business:

By teaching this course, I have agreed to observe all of the faculty responsibilities described in that document. By enrolling in this class, you have agreed to observe all of the student responsibilities described in that document. If the application of that Policy Statement to this class and its assignments is unclear in any way, it is your responsibility to ask me for clarification. Policy on Scholastic Dishonesty: Students who violate University rules on scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and/or dismissal from the University. Since dishonesty harms the individual, all students, and the integrity of the University, policies on scholastic dishonesty will be strictly enforced. You should refer to the Student Judicial Services website at <http://deanofstudents.utexas.edu/sjs/> or the General Information Catalog to access the official University policies and procedures on scholastic dishonesty as well as further elaboration on what constitutes scholastic dishonesty.

Class Web Sites and Student Privacy

Password-protected class sites will be available for all accredited courses taught at The University. Syllabi, handouts, assignments and other resources are types of information that may be available within these sites. Site activities could include exchanging e-mail, engaging in class discussions and chats, and exchanging files. In addition, class e-mail rosters will be a component of the sites. Students who do not want their names included in these electronic class rosters must restrict their directory information in the Office of the Registrar, Main Building, Room 1. For information on restricting directory information see: <http://www.utexas.edu/student/registrar/catalogs/gi02-03/app/appc09.html>.

Students with Disabilities

The University of Texas at Austin provides upon request appropriate academic accommodations for qualified students with disabilities. For more information, contact the Office of the Dean of Students at 471-6259, 471-4641 TTY.

Accommodations for Religious Holidays

By UT Austin policy, you must notify me of your pending absence at least fourteen days prior to the date of observance of a religious holy day. If you must miss a class, an examination, a work assignment, or a project in order to observe a religious holy day, you will be given an opportunity to complete the missed work within a reasonable time after the absence.