Syllabus

MEETINGS	1:30-2:50, Tues.-Thurs. starting Sept. 4
INSTRUCTOR	David Juran <djuran@stern.nyu.edu>
	<http://people.stern.nyu.edu/djuran/>
TEACHING ASSISTANT	Andrew Schwartz <ass629@stern.nyu.edu>

Course description and objectives: This course introduces the basic principles and techniques of applied mathematical modeling for managerial decision-making. Students will learn to use some of the more important analytic methods (e.g. spreadsheet modeling, optimization, Monte Carlo simulation), to recognize their assumptions and limitations, and to employ them in decision-making.

 Students will:

- Develop mathematical models that can be used to improve decision making within an organization.

- Sharpen their ability to structure problems and to perform logical analyses.

- Practice translating descriptions of decision problems into formal models, and investigate those models in an organized fashion.

- Identify settings in which models can be used effectively and apply modeling concepts in practical situations.

- Strengthen their computer skills, focusing on how to use the computer to support decision making.

The emphasis will be on model formulation and interpretation of results, not on mathematical theory. This course is aimed at Stern students with little prior exposure to modeling and quantitative analysis, but it is appropriate for all students who wish to strengthen their quantitative skills. The emphasis is on models that are widely used in diverse industries and functional areas, including finance, operations, and marketing.

Texts and Materials

We will disseminate materials through NYU Classes and the Professor-maintained site:
< http://people.stern.nyu.edu/djuran/2350home.htm >

There is no textbook, but if you are looking for a textbook that parallels the course, here are two good ones:

Practical Management Science, 5th edition, by Wayne Winston and Chris Albright (ISBN-13: 978-1305250901, ISBN-10: 1305250907).

Business Analytics: The Art of Modeling with Spreadsheets, Fifth Edition: The Art of Modeling with Spreadsheets, by Steve Powell and Ken Baker (ISBN-13: 978-1119386490, ISBN-10: 1119386497).

Software

This course assumes prior knowledge of Microsoft Excel at the level of the core courses in the Stern School. Building on that basis, we will introduce several Excel add-ins useful for decision modeling

Course Deliverables

There is no exam. There are eleven case studies as detailed in the schedule below, as well as a term project.

Assignments

Assignments must be submitted by the beginning of class on the due date. In fairness to other students and because solutions will be discussed in class, late assignments cannot be accepted. Watch for specific instructions from the TA about submitting assignments.

Guidelines for Written Work Due

- Keep discussions brief and to the point. Caution: Try to minimize the number of attached Excel sheets (in other words, zero). Instead, include your spreadsheet results as tables (or better yet, charts) integrated with your text. Please use a 12 point font.

- Number the pages. There is no page limit, but it is usually possible to do an excellent job in less than 5 pages, total.

- The report should begin with an executive summary of no more than 1 page, single spaced. Executive summaries usually begin with conclusions or recommendations, give reasons, and discuss important alternatives, limitations, assumptions, etc. The summary should make reference to specific pages or sections where supporting material is given in more detail.

- Your analysis should be given after the summary. This should include such items as rationale for choices that you made, outputs, plots, and any other material to support your summary and conclusions.

- Be sure to answer all of the questions posed in the case, but you need not be limited to those questions. For example, you may decide that some other analyses are appropriate to support your conclusions.

Grading

Attendance and Participation	20%
Homework	40%
Project	40%

Homeworks should be done individually or in a team of two (no threes!). They will be graded using the following somewhat subjective criteria:

- Check-Plus: Equivalent to 10 out of 10. Exceeds case expectations by providing unanticipated insight and/or unusually robust analysis compared with the rest of the class.
- Check: 9 out of 10. Fully meets the expectations of a thorough analysis and treatment of the key issues.
- Check-Minus: 8 or less. Below expectation by increasing degrees; significantly inferior to what other teams have done.

Class Participation

The class participation grade is based on my evaluation of the quality of each student's contribution during the semester. Each student is expected to join in the general classroom give-and-take. This requires not only familiarity with the assigned material, but also original thought and an ability to listen to the discussion. Quality is more important than quantity. Good questions, relevant experiences, points that build on previous points and insights into the business issue under discussion are the best forms of participation. We want to utilize the diversity of perspectives available in the classroom.

Project

The primary deliverable is a team project, both presented to the class orally and also documented in a zip file for the benefit of future students.

Ethical Guidelines

All students are expected to follow the **Stern Code of Conduct** (http://www.stern.nyu.edu/uc/codeofconduct). A student's responsibilities include, but are not limited to, the following:
- A duty to acknowledge the work and efforts of others when submitting work as one's own. Ideas, data, direct quotations, paraphrasing, creative expression, or any other incorporation of the work of others must be clearly referenced.
- A duty to exercise the utmost integrity when preparing for and completing examinations, including an obligation to report any observed violations.

Students with Disabilities

 If you have a qualified disability and will require academic accommodation during this course, please contact the Moses Center for Students with Disabilities (CSD, 998-4980) and provide me with a letter from them verifying your registration and outlining the accommodations they recommend.

Tentative Class Schedule
(subject to minor changes)

			Modeling Ideas	Assignment Due
1	Tue.	4-Sep	Course Intro	
2	Thu.	6-Sep	Solver	
	Tue.	11-Sep	NYU Holiday	
3	Thu.	13-Sep	Sensitivity Analysis Goal Seek, Data Table	
4	Tue.	18-Sep	SolverTable Solver Sensitivity Report	Install SolverTable
5	Thu.	20-Sep	Multiperiod Models Network Models	
6	Tue.	25-Sep	Network Models	Shelby Shelving Also: Submit the names of your project team.
7	Thu.	27-Sep	Network Models	
8	Tue.	2-Oct	Network Models	Foreign Currency and Westvaco Also: Write a one-sentence project idea.
9	Thu.	4-Oct	Portfolio Optimization Array Functions	
	Tue.	9-Oct	NYU Holiday	
	Thu.	11-Oct	TBA	
10	Tue.	16-Oct	Evolutionary Solver	Audit Activities Giant Motor
11	Thu.	18-Oct	Multiple Objective Optimization	
12	Tue.	23-Oct	Decision Analysis	Play Time Toys Assigning MBAs to Teams
13	Thu.	25-Oct	Monte Carlo Simulation	
14	Tue.	30-Oct	Monte Carlo Simulation	Durham Westhouser
15	Thu.	1-Nov	Monte Carlo Simulation	
16	Tue.	6-Nov	Monte Carlo Simulation	Subway Tokens Bonds
17	Thu.	8-Nov	Monte Carlo Simulation	
18	Tue.	13-Nov	Monte Carlo Simulation	Ski Jackets
19	Thu.	15-Nov	Monte Carlo Simulation	
	Tue.	20-Nov	TBA	
	Thu.	22-Nov	NYU Holiday	
20	Tue.	27-Nov	Monte Carlo Simulation	College Funding
21	Thu.	29-Nov	Project Presentations	
22	Tue.	4-Dec	Project Presentations	
23	Thu.	6-Dec	Project Presentations	
24	Tue.	11-Dec	Project Presentations	