

UNIVERSITY OF SAN FRANCISCO
School of Business and Management
McLaren School of Business

MBA 612 Decision Modeling and Data Analysis Section 1

Course Outline (Syllabus), Fall Semester, 2007

0303-612-01 Tuesday 6:15 to 9:55 p.m. Malloy Hall LL5

Instructor: Mike Middleton (Professor Michael R. Middleton, Ph.D.)

USF Office: Malloy 232

Office Hours: Tues. & Thurs., 1:00–3:00 p.m.

Office Phone: 415-422-6768

Course Info: USF Blackboard

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Prerequisite: 0303-602 Grad. Intro. to Bus. Math., or equivalent
0303-603 Grad. Intro. to Bus. Stat. , or equivalent

Course Description: This course develops the skills and perspectives of using quantitative techniques to gain insight into the resolution of practical business problems. Methodologies incorporate decision analysis, including decision models, sensitivity analysis, Monte Carlo simulation, decision trees, value of information, and risk attitude; descriptive statistics and multiple regression models for modeling relationships, including time series models and forecasting; and optimization models, including linear, nonlinear, and integer programming applications in marketing, finance, and other fields. The emphasis is on model formulation, spreadsheet analysis, and the interpretation of results, rather than mathematical theory.

Required Books: Hammond, Keeney, Raiffa, Smart Choices: A Practical Guide To Making Better Life Decisions, Broadway Books, paperback, 2002, new and used copies usually available in USF Bookstore and from many other booksellers.

Middleton, Decision Analysis Using Microsoft Excel: August 2007, spiral-bound 281-page course reader, available only in USF Bookstore.

Middleton, Data Analysis Using Microsoft Excel: August 2007, spiral-bound 145-page course reader, available only in USF Bookstore.

Main Learning Objective: To be able to make effective operational and strategic decisions using concepts, methods, and quantitative tools from the fields of decision modeling and data analysis.

Secondary Learning Objectives:

1. Develop quantitative models for structured and unstructured decision problems by identifying controllable factors, uncontrollable factors, performance measures, and relationships.
2. Develop and analyze financial and other types of planning models, and perform sensitivity analysis to identify critical factors.
3. Measure uncertainty using probability, and perform Monte Carlo simulation to gain insight into practical business problems.
4. Develop and analyze decision tree models for sequential decision problems, and determine value of information.
5. Develop, solve, and interpret the results of spreadsheet optimization models.
6. Use descriptive statistics and charts to summarize cross-sectional and time series data.
7. Develop regression models to explain variation, measure relationships, and make predictions.
8. Identify patterns in time series data, develop appropriate models, and make forecasts.
9. Attain proficiency in the use of spreadsheets for quantitative analysis.

Attainment of objectives is assessed by quizzes, homework assignments covering concepts with computer-based analysis, case studies, in-class exercises, and projects with papers and presentations applying techniques to real-world situations.

Quizzes and Grading: (Quizzes: 30%) There is a 90-minute midterm quiz and a 180-minute final quiz. The midterm determines 10% of your course score and the final quiz determines 20%. Each quiz is open-books and open-notes, and you may use a simple calculator. You may not use a computer, cell phone, or other communication device. You may not share books, course materials, or calculators during a quiz.

(Project: 15%) The course project (presentation in class and paper report) determines 15% of your course score. Preliminary work (proposing a topic and getting feedback on preliminary analysis) may be included in homework assignments. You may work on the project individually or in a small group of two or three students (recommended).

(Homework: 45%) There are eleven graded homework assignments. The two lowest homework scores will be excluded when computing your course score. The nine highest homework scores each determine 5% of your course score. You may work on the homework assignments individually (recommended) or in a small group of two or three students. To encourage you to meet other students, you may work with the same person for a maximum of three homework assignments. Some homework assignments must be done individually.

(Other Deliverables: 10%) There are approximately seven in-class exercises, short quizzes, etc. These deliverables are unscheduled, unannounced, and pretty-much random, with no make-ups. Your best five scores each determine 2% of your course score.

There are no extra-credit assignments. Letter grades for the course are based upon your weighted course score relative to the distribution of course scores for all students. There is no predetermined grading scale. I plan to assign grades so that the class GPA is approximately the same as the GPA for other 600-level MBA courses.

Important Dates: The 90-minute midterm quiz is 6:15 to 7:45 p.m., Tues., Oct. 16, 2007. The 180-minute final quiz is 6:15 to 9:15 p.m., Tues., Dec. 11, 2007.

Graded Homework: The eleven homework assignments are announced in class at least one week in advance of their due dates. Late assignments may earn maximum half-credit if received before on-time papers are returned to students. Ancient assignments are not accepted. If you choose to work in a group of two or three students, be sure that each member of the group develops the computer skills and understanding of the course material. The paper you hand in should be an indication of the effort, understanding, and accomplishment of each individual of the group.

Homework Assistance: If you have a question about a homework assignment, first check Blackboard to see if additional information or corrections are available. Also, consult your student colleagues for assistance. Or, contact a course tutor. If you send email to me, describe your problem clearly. Please do not send me an email attachment.

Format for Homework and Project Papers: To help me manage the hundreds of student papers during the semester, print your name in the extreme top right corner of the first page, either typed or legibly printed. If you think I might be confused regarding your first and last names, use all capital letters for your last name. Do not use a separate cover page. For papers on assignments when multiple authors are allowed, list the names in last-name alphabetical order. To discourage last-minute freeloaders, papers with multiple authors must have the names typed, not hand-written. Homework usually has multiple parts; clearly label the parts A, B, C, ..., and arrange the pages in sequence. Staple the sheets in the top left corner. Do not use a paper clip.

Homework Feedback: For some of the eleven assignments, I may mark the paper “OK” or 100 without additional comment. On other assignments, I may write detailed comments for specific parts. In either case, if you have a question about your assignment, first contact your student colleagues for explanations. Usually more than two-thirds of the students work all parts satisfactorily and receive full credit. For more feedback, contact a course tutor or see me during office hours.

Attendance: Students are expected to attend class regularly. The midterm and final quizzes may include topics discussed in class that are not in the books, and attending class will generally be an effective use of your time. You must be present for the midterm and final quizzes, and you must be present to receive credit for the "other deliverables."

Missing Class: Except for the midterm and final quizzes, you do not have to notify me if you must miss a class. Instead, notify one of your student colleagues, and ask him or her to share notes and pick up a copy of any class handouts for you. Also, ask a student colleague to hand in your homework assignment. Do not send your homework to me via email. Instead, if you cannot provide the printed homework to a fellow student to hand in, arrange to send it via email to your colleague so that he or she can print it out for you and hand it in.

Make-up Quizzes: If you cannot attend the midterm or final quiz, you must notify me before the scheduled quiz time if you wish to be eligible for a make-up. If you cannot notify me personally or by phone, leave a message on my office phone or send me an email. If you are eligible for a make-up midterm quiz, it must be scheduled prior to the next class meeting.

Preparing for Class: Read assignments in Hammond's Smart Choices paperback before class so that you will be prepared for discussion. You may study new material in the Middleton course readers for discussion at the next class, or you may refer to the course readers during and after the class lecture. If you have a question about course material, make a note, and ask your question in class when the topic is discussed.

Spreadsheet Software: Spreadsheets provide a very flexible environment for analyzing data and modeling decision problems, and more decision makers have access to spreadsheets than special-purpose software. One of the most useful skills that a manager can have is expertise in the use of a spreadsheet program. I use a recent Windows Excel version in class. You may use Windows Excel 97–2007 or Macintosh Excel X or 2004 for your homework assignments and projects.

Excel Add-Ins: Three Excel add-ins are available during the semester for download from the Blackboard web site: TreePlan for decision tree models; SensIt for sensitivity analysis of business planning models; and RiskSim for Monte Carlo simulation. Two other add-ins, Analysis ToolPak and Solver, are available from the Office or Excel installation disk.

Office Hours: I am very conscientious regarding my office hours. My office door is usually closed. Please knock, and if I appear not to be there, please wait a few minutes for my return. If I must miss office hours, I will make an announcement in class and put a note near my office door. In an emergency, the receptionist will post a note.

Disability Related Services: I am interested in making sure you receive a quality education. If you need accommodation as a result of a disability, contact the USF Student Disability Services, 415-422-2613, as soon as possible, and then see me during my office hours. Confidentiality will be maintained.

Academic Honesty and Dishonesty: I expect students to be honest in their academic work. It is the student's responsibility to remain above suspicion. If I suspect a student of cheating on a quiz or other course work, I will assign a score of zero or a failing grade and report the incident to my deans. If you have any questions about what constitutes appropriate or inappropriate behavior, please ask me.

Incomplete: It is my policy to grant the Incomplete grade only in cases of illness, accident, or change in work hours during the last weeks of classes. The attending physician or employer must verify the extreme emergency in writing.

Tentative Schedule of Fall 2007 MBA 612 Course Topics

"Hammond" refers to the Smart Choices paperback; read the assigned chapter before class. "Middleton Decision" refers to the spiral-bound Decision Analysis Using Microsoft Excel: August 2007 course reader, and "Middleton Data" refers to the spiral-bound Data Analysis Using Microsoft Excel: August 2007 course reader; read the assigned material during or after class.

Aug. 28

01 - Decision Models and Sensitivity Analysis

Hammond, Ch. 1, "Making Smart Choices"

Hammond, Ch. 2, "Problem"

Middleton Decision, Ch. 1, "Introduction to Decision Modeling"

Middleton Decision, Ch. 2, "Sensitivity Analysis Using Excel"

Middleton Decision, Ch. 3, "Sensitivity Analysis Using SensIt"

Middleton Decision, Ch. 4, "Multiperiod What-If Modeling"

Sep. 4

02 - Monte Carlo Simulation

Hammond, Ch. 3, "Objectives"

Hammond, Ch. 4, "Alternatives"

Middleton Decision, Ch. 6, "Introduction to Monte Carlo Simulation"

Middleton Decision, Ch. 7, "Uncertain Quantities"

Middleton Decision, Ch. 8, "Simulation Without Add-Ins"

Middleton Decision, Ch. 9, "Monte Carlo Simulation Using RiskSim"

Middleton Decision, Ch. 10, "Modeling Uncertain Relationships"

Homework 1 due, Sensitivity Analysis

Sep. 11

03 - Multi-Attribute Utility

Hammond, Ch. 5, "Consequences"

Hammond, Ch. 6, "Tradeoffs"

Middleton Decision, Ch. 5, "Multiattribute Utility"

Homework 2 due, Monte Carlo Simulation

Sep. 18

04 - Decision Trees

Hammond, Ch. 7, "Uncertainty"

Hammond, Ch. 8, "Risk Tolerance"

Middleton Decision, Ch. 14, "Introduction to Decision Trees"

Middleton Decision, Ch. 15, "Decision Trees Using TreePlan"

Middleton Decision, Ch. 16, "Strategies in Decision Trees"

Middleton Decision, Ch. 17, "Sensitivity Analysis for Decision Trees"

Middleton Decision, Ch. 18, "Decision Trees with Multiattribute Outcomes"

Homework 3 due, Multi-Attribute Utility

Sep. 25

05 - Value of Information

Hammond, Ch. 9, "Linked Decisions"

Hammond, Ch. 10, "Psychological Traps"

Middleton Decision, Ch. 19, "Value of Information in Decision Trees"

Middleton Decision, Ch. 20, "Value of Imperfect Information"

Homework 4 due, Decision Trees

Oct. 2

06 - Risk Attitude

Hammond, Ch. 11, "The Wise Decision Maker"

Middleton Decision, Ch. 21, "Modeling Attitude Toward Risk"

Middleton Decision, Ch. 22, "Risk Attitude Using TreePlan"

Middleton Decision, Ch. 23, "Making Choices Under Uncertainty"

Homework 5 due, Value of Information

Oct. 9

07 - Multi-Period Models, Review

Middleton Decision, Ch. 11, "Multiperiod Simulation Modeling"

Middleton Decision, Ch. 12, "Modeling Inventory Decisions"

Middleton Decision, Ch. 13, "Modeling Waiting Lines"

Review for midterm quiz

Homework 6 due, Risk Attitude

Oct. 16

08 - Midterm Quiz (6:15 to 7:45 p.m., Tues., Oct. 16, 2007), **Data Analysis**

Middleton Data, Ch. 1, "Introduction to Data Analysis"

Middleton Data, Ch. 2, "Univariate Numerical Data"

Middleton Data, Ch. 3, "Bivariate Numerical Data"

Middleton Data, Ch. 4, "One-Sample Inference for the Mean"

Oct. 23

09 - Regression Models for Analyzing Relationships

Middleton Data, Ch. 5, "Simple Linear Regression"

Middleton Data, Ch. 6, "Simple Nonlinear Regression"

Middleton Data, Ch. 7, "Multiple Regression"

Middleton Data, Ch. 9, "Regression Models for Cross-Sectional Data"

Homework 7 due, Descriptive Statistics

Oct. 30

10 - Regression Using Categorical Variables

Middleton Data, Ch. 8, "Regression Using Categorical Variables"

Middleton Data, Ch. 10, "Time Series Data and Forecasts"

Middleton Data, Ch. 11, "Autocorrelation and Autoregression"

Homework 8 due, Multiple Regression

Nov. 6

11 - TBA

Nov. 13

12 - Time Series Seasonality

Middleton Data, Ch. 12, "Time Series Smoothing"

Middleton Data, Ch. 13, "Time Series Seasonality"

Middleton Data, Ch. 14, "Regression Models for Time Series Data"

Homework 9 due, Regression Using Categorical Variables

Nov. 20

13 - Product Mix Optimization

Homework 10 due, Time Series Seasonality

Nov. 27

14 - Optimization Models for Marketing, Operations, and Finance

Homework 11 due, Optimization Models

Dec. 4

15 - Project Presentations, Review

Presentations of course projects

Review for Final Quiz

Tuesday, Dec. 11, 2007

6:15 to 9:15 p.m.

Final Quiz (covers all course topics)

Course Project Paper due

Instructor Information: Mike Middleton

Fall 2007

Michael R. Middleton, Ph.D.

Office: Malloy 232

Hours: Tuesday, 1:00 to 3:00 p.m.;
Thursday, 1:00 to 3:00 p.m.;
and other times by appointment.
Thursday, August 23, through Tuesday, Dec. 4, 2007

Appointments for these office hours are not required. For meetings at other times, please arrange appointments by e-mail, phone, or at class times. My office door is usually closed. Please knock.

Classes: MBA 612, Section 1 (0303-612-01)
Decision Modeling and Data Analysis, Malloy LL5
Tuesday, 6:15 to 9:55 p.m.

BA 204, Section 5 (0303-204-05)
Quantitative Business Analysis, Malloy LL4
Tuesday and Thursday, 3:30 to 5:15 p.m.

MBA for Executives: Sep. 14–15, Sep. 28–29, Dec. 7–8

Contacts: Course Info: blackboard.usfca.edu
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415-422-6768, Office, Malloy 232 (voice mail)
415-422-6771, School Receptionist
415-422-2502, School Fax
San Francisco Home: 415-931-7823
Sea Ranch Home: 707-785-3258