

Decision Modeling and Data Analysis
MBA for Executives
MBAE 2010-1 Orange & 2010-2 White
Course Outline (Syllabus)
September–November 2009

MBAE 6912-01
University of San Francisco
School of Business and Professional Studies
Masagung Graduate School of Management

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Learning Objectives

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 unstructured decision problems by identifying controllable factors, uncontrollable factors, performance measures, and relationships.
2. Develop and analyze financial 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. Use descriptive statistics and charts to summarize cross-sectional and time series data.
6. Develop regression models to explain variation, measure relationships, and make predictions.
7. Identify patterns in time series data, develop appropriate models, and make forecasts.

Grading

Homework	60%	(3 @ 20% each; late: max half credit)
Project	30%	(proposal 5%, presentation 10%, and short paper 15%)
Final Quiz	10%	(one hour, in-class, books, notes, calculator)

Course letter grades are assigned to total course score based on rank relative to other students.

Materials

Hammond, Keeney, Raiffa, Smart Choices: A Practical Guide To Making Better Life Decisions. Read this entire paperback for the first several class meetings.

Middleton, Decision Analysis Using Microsoft Excel: August 2009, bound 277-page course reader. Bring this duplicated material to each class.

Middleton, Data Analysis Using Microsoft Excel: August 2009, bound 145-page course reader. Bring this duplicated material to each class.

Schedule

Chapter titles from the Decision Analysis and Data Analysis course readers are shown below in quotes, for skimming, reading, or studying, usually during class or after the topic is discussed in class. The course will not cover all sections of the chapters listed below. Each homework assignment is handed out in the previous class. All duplicated materials (PDF), Excel add-ins (XLA), and Excel files (XLS) are available on Blackboard.

Sep. 12, Saturday morning, Session DD 1

Before Class: No Readings

Deliverable: None

Session Topics: Decision Models, Sensitivity Analysis, Descriptive Statistics

Decision Analysis: Ch. 1, "Introduction to Decision Modeling"
Ch. 2, "Sensitivity Analysis Using Excel"
Ch. 4, "Sensitivity Analysis Using SensIt"
Ch. 5, "Multiperiod What-If Modeling"

Data Analysis: Ch. 1, "Introduction to Data Analysis"
Ch. 2, "Univariate Numerical Data"

Sep. 26, Saturday afternoon, Session DD 2

- Before Class: Read Smart Choices, Introduction, Preface, Chapters 1 through 5 (Making Smart Choices, Problem, Objectives, Alternatives, Consequences, 86 pages)
- Deliverable: Homework #1 (sensitivity analysis, SensIt tornado chart, histogram)
- Session Topics: Uncertain Quantities, Monte Carlo Simulation, Simple Regression
- Decision Analysis: Ch. 7, "Introduction to Monte Carlo Simulation"
Ch. 8, "Uncertain Quantities"
Ch. 9, "Simulation Without Add-Ins"
Ch. 10, "Monte Carlo Simulation Using RiskSim"
Ch. 11, "Modeling Uncertain Relationships"
Ch. 12, "Multiperiod Simulation Modeling"
Ch. 13, "Modeling Inventory Decisions"
Ch. 14, "Modeling Waiting Lines"
- Data Analysis: Ch. 3, "Bivariate Numerical Data"
Ch. 4, "One-Sample Inference for the Mean"
Ch. 5, "Simple Linear Regression"
Ch. 6, "Simple Nonlinear Regression"

Oct. 10, Saturday morning, Session DD 3

- Before Class: Read Smart Choices, Chapters 6 through 9 (Tradeoffs, Uncertainty, Risk Tolerance, Linked Decisions, 106 pages)
- Deliverable: Homework #2 (RiskSim Monte Carlo simulation, simple regression)
- Session Topics: Decision Trees, Multiple Regression
- Decision Analysis: Ch. 15, "Introduction to Decision Trees"
Ch. 16, "Decision Trees Using TreePlan"
Ch. 17, "Strategies in Decision Trees"
Ch. 18, "Sensitivity Analysis for Decision Trees"
- Data Analysis: Ch. 7, "Multiple Regression"
Ch. 8, "Regression Using Categorical Variables"
Ch. 9, "Regression Models for Cross-Sectional Data"

Oct. 17, Saturday afternoon, Session DD 4

Before Class: Read Smart Choices, Chapters 10 and 11, Roadmap (Psychological Traps, The Wise Decision Maker, 56 pages)

Deliverable: Homework #3 (TreePlan decision tree, multiple regression), Project Proposal

Session Topics: Multiattribute Utility, Value of Information, Risk Attitude Utility, Time Series

Decision Analysis: Ch. 6, "Multiattribute Utility"
Ch. 19, "Decision Trees with Multiattribute Outcomes"
Ch. 20, "Value of Information in Decision Trees"
Ch. 21, "Value of Imperfect Information"
Ch. 22, "Modeling Attitude Toward Risk"
Ch. 23, "Risk Attitude Using TreePlan"
Ch. 24, "Making Choices Under Uncertainty"

Data Analysis: Ch. 10, "Time Series Data and Forecasts"
Ch. 11, "Autocorrelation and Autoregression"
Ch. 12, "Time Series Smoothing"
Ch. 13, "Time Series Seasonality"
Ch. 14, "Regression Models for Time Series Data"

Nov. 7, Saturday morning, Session DD 5

Before Class: No Readings

Deliverable: Course Project

Session Topics: Quiz (first hour), Project Presentations