MBAD 6122 Decision Modeling and Analysis via Spreadsheets

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Course Web Page: Access via Moodle or directly via the course website URL which will be emailed to all registered students.

Text:  
ISBN: 0-538-74631-9  

It can be purchased from Cengage (publisher), UNC Charlotte bookstore (Barnes&Noble), Gray's bookstores, www.bestbookbuys.com, www.amazon.com and various other sources.

Hardware and Software note: Students must have access to a Windows laptop with Excel 2007 or 2010. Analytic Solver Platform does not run on Apple unless they use Windows virtualization software, such as Parallels, VMware, or the free VirtualBox from Oracle and also have Excel 2007 or 2010 on Macs or MacBooks.

Also, the recorded lectures only work on Windows laptops/PCs.

Class Format: HYBRID  Spring 2014

In order to allow more flexibility for the students in our MBA program, the Belk College of Business is offering MBA courses via hybrid format. The class will meet face-to-face alternating weeks for problem and case exercises, and for in class portions of the exams. Online components include recorded lectures, essentially covering the entire course, examples and other materials made available via the course webpage and/or Moodle. Students are expected to study the online lectures along with the textbook and other materials hence the F2F meetings will largely focus on applying the theory and concepts via problems and cases.

Additional Readings: Select articles and cases will be posted or emailed as attachments.

Course Description: This course is designed to provide students, primarily in the fields of business and economics, with a sound conceptual understanding of the role management science plays in the decision making process. This is an important course in developing decision models and their application to management problems. The emphasis is on models that are widely used in all industries and functional areas, including operations, supply chain management, finance, accounting, and marketing.
The rapid and phenomenal advances in computing have propelled the use of decision models in recent years. Today’s inexpensive and fast computing capabilities coupled with friendly and intuitive user interfaces, such as spreadsheets, have been complemented by the availability of large volumes of previously unavailable data, such as the automatic capture of point-of-sale information, and easy access to large databases (e.g., Enterprise Resource Planning (ERP) and Customer Relationship Management (CRM) systems.) Personal computers, laptops, tablets, and even smart phones with user friendly interfaces have become effective “delivery vehicles” for powerful decision models that were once the exclusive province of experts. Information has come to be recognized as a critical resource, and models play an increasingly critical role in deploying this resource, in organizing and structuring information so that it can be used more productively. Specific topics covered in this course include fundamental techniques such as linear, integer, goal and multi objective programming, queuing theory and applications, decision support via Monte Carlo simulation, decision making under uncertainty and risk, decision trees, and multi-criteria decision making.

Typical class format will include brief discussion on background theory, by initially simpler and smaller business problems (often provided by recorded lectures posted on the course webpage), followed by group exercises that are more realistic and larger in size and scope. The emphasis will be on both formulating an appropriate model for a given business problem and developing an Excel based solution approach by utilizing built-in and add-in software tools like Data Analysis and RiskSolver.

**Prerequisites:** MBAD 5141/5142. A keen interest in problem solving (logic, math, and statistics) and a desire to practice higher level analytics and applied information technology skills.

**Catalog Description:** MBAD 6122. Decision Modeling and Analysis via Spreadsheets. (3G) Prerequisite: MBAD 5141/2 or equivalent. An analytical approach to the management process. Generalized models for decision making with major emphasis on application of the scientific method to management problems. (Yearly)

**Statement on Diversity:** The Belk College of Business strives to create an inclusive academic climate in which the dignity of all individuals is respected and maintained. Therefore, we celebrate diversity that includes, but is not limited to ability/disability, age, culture, ethnicity, gender, language, race, religion, sexual orientation, and socio-economic status.

**Grading and exam format:**

**Under revision…TBD**

**Individual vs. group work:** You are encouraged to study in groups, solve the suggested problems together, and simply help each other learn the material. During the exams for both group and individual parts you should not get help from any outside source or person. When permitted, solve the group part in your group, otherwise work alone.
**Academic honesty/integrity**: THE UNC CHARLOTTE CODE OF STUDENT ACADEMIC INTEGRITY governs the responsibility of students to maintain integrity in academic work, defines violations of the standards, describes procedures for handling alleged violations of the standards, and lists the applicable penalties. The following is a list of prohibited conduct in that Code as violating these standards: A) Cheating; B) Fabrication and Falsification; C) Multiple Submission; D) Plagiarism; E) Abuse of Academic Materials; and F) Complicity in Academic Dishonesty. For more detail and clarification on these items and on academic integrity, students are strongly advised to read the current "[UNCC undergraduate catalog](#). The instructor may ask students to produce identification at examinations and may require students to demonstrate that graded assignments completed outside of class are their own work.

**Detailed course schedule is available to registered students via Moodle and the course webpage URI will be emailed to all on January the 4th.**

**Tentative Course Outline**

**Intro to Modeling Chap. 1, 2**

The emphasis is on the process of building models by capturing the essence of a real problem into a model, spreadsheet or otherwise.

**Intro to optimization and linear programming Chap. 3**

Practice building models for different application domains and implementing them in Excel; Product mix, blending problems, portfolio optimization, foreign exchange, recycling, investment, and marketing examples.

Case: Putting the Link in the Supply Chain

**Sensitivity analysis Chap. 4**

Post optimally analysis for large-scale applications to address managerial questions, and evaluate new alternatives

Case: Revenue Management at Piedmont Air
Case: HiTek Corp. Early Retirement Program

**Network modeling Chap. 5**

Study some of the well-known models such as transportation, transshipment, assignment models, supply chain optimization; multi period modeling of plant/equipment replacement; leasing office space; multi period product/cash flow optimization models

Case: Mecklinburg School Assignment Project

**Integer linear programming Chap. 6**
Advantages, disadvantages of using integer variables; various uses of binary variables applied to problems in project selection, plant location, emergency response vehicle/base location, modeling fixed vs. variable costs using binary variables; airline crew scheduling, timber harvest examples.

Case 1: Kelley School of Business MBA Program Group Assignment Project

Case 2: Power Dispatching at Old Dominion

**Goal programming and multi objective modeling Chap. 7**

Handling multiple goals (targets) or objectives; re-visit/re-formulate some of the earlier examples;

Case: Mecklinburg School Assignment Project (Goal Prog. version)

**Predictive Modeling (Brief Coverage)**
- Regression Analysis Chap. 9
- Discriminant Analysis Chap. 10
- Time Series Forecasting Chap. 11

**Decision Support using Monte Carlo Simulation approach Chap. 12**

Modeling risky decisions via Monte Carlo simulation; simulating new product introduction; simulation of financial models.

Case: Should Charlotte Motor Werks, Co. Introduce a New Roadster

**Queuing Theory and Applications Chap. 13**

Various analytical models for typical waiting line problems via a built-in Excel template.

Case: May the (Police) Force be with You

**Decision Analysis Chap. 14**

Decision making under uncertainty and risk, decision trees, multi-criteria decision making; Analytical Hierarchy Process applications to vendor/software selection; plant/operations site evaluation.

Case: Should Larry Junior Go to Court or Settle?

**Academic Calendar:** [http://registrar.uncc.edu/calendar](http://registrar.uncc.edu/calendar)