Mathematics with Business Applications
Fall 2013

A. Instructor: Prof. Chih-Ming Lee

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Class Hours: Monday, 14:10-17:10

Office Hours: By appointment

B. Books

1. Textbook: F. S. Hillier and M. S. Hillier, Introduction to management Science: A Modeling and Case Studies Approach with Spreadsheets, International Edition 2011, McGraw-Hill.

2. Reference Books: Bernard W. Taylor, *Introduction to Management Science*, 11th Edition, Pearson.

C. Course Objectives

This course is an introduction to how quantitative models to be applied in aiding managerial decision-making. In practice, spreadsheets provide a comfortable and familiar environment for formulating and analyzing managerial problems. The spreadsheet takes care of applying the necessary mathematics automatically in the background with only a minimum of guidance by the user. Therefore, managers do not need to know any of the heavy mathematical theory. We will emphasize the use of spreadsheets throughout entire course. The topics covered in this course are as follows: Linear programming, Network Optimization Problems, Binary Integer Programming, Decision Analysis, etc. MS EXCEL will be the primary tool for the problem modeling and solving.

D. Grading Policy

Group Project--40%

In-class Discussion--20%

Final Exam--40

E. Important Notes and Policies

Students are encouraged to discuss and share the ideas of course materials in class. Each student is required to joins the discussion at least four times.

F. Schedule

Week	Date	Content
1	09/16	Course Introduction
2	09/23	Modeling with Spreadsheet
3	09/30	Linear Programming: Basic Concepts
4	10/07	Linear Programming: Basic Concepts
5	10/14	Linear Programming: Formulation and Applications
6	10/21	Linear Programming: Formulation and Applications
7	10/28	The Art of Modeling with Spreadsheets
8	11/04	The Art of Modeling with Spreadsheets
9	11/11	Group Project Progress Report
10	11/18	Group Project Progress Report
11	11/25	What-If Analysis for Linear Programming
12	12/02	What-If Analysis for Linear Programming
13	12/09	Network Optimization problems
14	12/16	Network Optimization problems
15	12/23	Binary Integer Programming
16	12/30	Group Project Final Presentation
17	01/06	Group Project Final Presentation
18	01/13	Final Exam

Project Description:

The followings are the format for the final project report

1. Cover page: cover page of the report should include class title, project title, team members' names, students' IDs.
2. Table of content
3. List of tables (if necessary)
4. List of figures (if necessary)
5. Total number of pages should not exceed 20 pages.
6. Format of the report: 1.5 lines spacing, 2.5 cm to left, 2.5 cm to top, right and bottom. Place page numbers on right bottom corner and use fonts of size 12.
7. Your report should include at least the following sections:
   - Introduction: importance of the topic, purpose of the study, etc.
   - Model description: methodology, assumptions, limitations, performance measures, etc.

- Data collection: what are the data needed, why to use the data, how to collect the data, etc.
- Results and conclusions.
- References: Web site, journal, magazine, newspaper, sponsored stores, etc.

8. Evaluation Criteria for report: (by instructor)
   - (20%) Purposes of study (creativity, rationales, etc.)
   - (20%) Data collection (sources of data, methods and processes of collecting the data, etc.)
   - (20%) Methodology (appropriateness of the methods used, rationale of the methods, etc.)
   - (20%) Results and conclusions (origination, innovation, future development, etc.)
   - (20%) Documentation (quality of report, spelling, format, etc.)

9. Evaluation Criteria for presentation: (by instructor and classmates)
   - (70%) Contents
   - (30%) Presentation skills

There will be around 15 group projects dependent on the number of students in the class, and each group consists of two to three students. The instructor will determine 50% of the grades for the group project presentation and the rest of the classmates will decide the rest of the grades. Reports of group projects are submitted before final exam.