SYLLABUS FOR 6K:176

Fall 1996

Managerial Decision Models

Instructor: Prof. Yinyu Ye

Class Hours: 1:05-2:20PM TTh, W107 PBAB

Office: S384 PBAB, Tel: 335-1947

Office Hours: 9:30-11:00PM TTh, or by appointment

TA: Tianbing Qian

Prerequisites: 6K:070 and 6K:071

Textbook: *Introductory Management Science*, (4-5)th ed., Prentice Hall, 1994, by G. Eppen, F. J. Gould, and C. Schmidt. Available at Iowa Book & Supply.

Additional Course Material: There will be packet for purchase at the copy center containing an instruction guide for EXCEL. EXCEL is the computer software that we will use for most of the course. It is available at the computer network in PBAB.

Grades: Your grade in this course will be based on homework, two exams and a case study as indicated in the table below. The course is divided into two parts, and each of the two exams will mainly cover the material from that part. However, knowledge of previous material is helpful in the latter exam.

6 quizs	150 points	
2 case study	100 points	
Midterm Exam	100 points	Oct. , 1996
Final Exam	150 points	Dec. , 1996
Class participation	50 points	

Grading Policy: At the end of the semester, I will graph your raw scores and assign letter grades according to where the natural breaks occur in the graph. Students should feel an incentive to master the material. There is no sense in which contributing legally to the learning of another student can hurt your grade.

Objectives: This course introduces the quantitative decision models used in solving management problems. These problems appear in very diverse areas in business, industry and government. Hopefully, you will be in a position to be an intelligent user of these models. You will learn how to formulate a given problem, use the computer to solve it, and finally how to interpret the computer output.

The course is divided into two parts. The first part, chapters 1-9, introduces the all important *linear programming*, *integer programming*, *network optimization*, and their diverse applications to management science problems. Chapters 2 and 5 are very important and you are strongly advised to pay close attention to them. In particular, you should try to solve as many problems as possible from the end of these two chapters. In chapter 2, you will learn how to take a real world problem and formulate it as a linear program. In chapter 5, you will learn how to enter this formulation into EXCEL, how to solve it using EXCEL, and finally how to analyze the answers the computer provides. Chapters 7 and 9 cover network decision models, and chapter 8 integer programming. Although network problems are linear programming problems and thus can be solved by methods learned in the first part of the course, we treat them separately because they are important in their own right, and because we use more efficient methods to solve them.

The second part of the course deals with probabilistic decision models including *simulation*, *project management*, *queuing model*, and *decision analysis*. These subjects are covered in chapters 13-17. This part is devoted to clarifying our ways of thinking about uncertainty and unpredictability, and developing models for dealing with them in decision making. The goal is to help you frame problems in which uncertainty plays a major role in a consistent and useful manner and to provide you with some helpful problem-solving techniques.

COURSE OUTLINE FOR 6K:176
Fall 1996

Chapter and Topic

1. INTRODUCTION
(Section 3 excluded)

2. LINEAR PROGRAMMING: MODEL FORMULATION

3. LINEAR PROGRAMMING: GRAPHICAL SOLUTION

4. ANALYSIS OF LP MODELS: GRAPHICAL APPROACH

5. LINEAR PROGRAMS: COMPUTER ANALYSIS

    Case I

7. TRANSPORTATION AND ASSIGNMENT PROBLEMS
(Sections 8 & 9 excluded)

9. NETWORK MODELS

    Midterm Exam

8. INTEGER PROGRAMMING
(Sections 1-10)

15. PROJECT MANAGEMENT : PERT & CPM

13. SIMULATION

    Case II

17. QUEUEING MODELS

14. DECISION ANALYSIS

    Final Exam