Economics 480/580, Section 1.
Introduction to the Tools of Mathematical Economics
Professor C. Howe & Mr. Abdallah Dah
Spring 1985

Introduction to the basic non-probabilistic mathematical tools of economic analysis. Prerequisites are Math 107 and 108 (algebra, linear equations and matrices, and differential calculus of functions of one variable) and Economics 201 and 202.

Class procedures. The text is Chiang, Fundamental Methods of Mathematical Economics, Third Edition. Reading and homework problems will be assigned each week and the homework problems will be discussed at the beginning of the following period, along with general student questions. It is highly advisable not to get behind in reading and homework.

Quizzes and final exam. Thirty minute quizzes will be given approximately every 3 weeks, usually on Thursdays at the beginning of the hour. The student can drop the lowest quiz grade, whatever the cause (missed quiz, illness, skiing, etc.). No make-up tests will be given. The final exam is required of all students (including graduating seniors.) It will be comprehensive, covering the major topics of the semester, and will count 1/3 of the grade.

The order of topics will be approximately as follows:

1. General review of economic models, mathematical economics versus econometrics, sets, relations, functions, equilibrium solutions to models.
   Chapters 1, 2, 3.

2. Linear models, matrix algebra, the inverse matrix, Cramer's Rule, homogeneous equation systems, and Input-Output (Leontief) models.
   Chapter 4 (not Secs. 4.3, 4.4)
   Chapter 5 (not after p. 127)
   & skip 5.5 and 5.6 (omit finding $A^{-1}$ by approximation).
3. Comparative static analysis and the use of differential calculus: nature of comparative static analysis, rules of differentiation, partial derivatives of functions of several variables, and applications.
   Chapter 6 (only Sec. 6.1 and 6.3)
   Chapter 7 (review rules only; no proofs)
   Chapter 8 (through Sec. 8.4 only for 480 students. 580 students are responsible for Sec. 8.5)

4. Optimizing models: Maximizing and minimizing.
   Chapter 9 (only through 9.4)
   Chapter 11 (except 11.3)
   Chapter 12
   Chapter 20 (20.1 and 20.2)

5. Linear programming: an important special case of optimizing.
   Chapter 18 (Secs. 1, 2 only)
   Chapter 19 (Secs. 1, 2, 3 only)

6. The theory of games of strategy: further applications of linear models.
   Chapter 21