QUANTITATIVE METHODS IN ECONOMICS

Prof. Hsiao

The main purpose of this course is to study mathematical tools generally used in graduate economic theory and econometrics, as well as other economic courses. It consists of three parts. Part I: Matrix Theory; Part II: Static Analysis; Part III: Dynamic Analysis. Emphasis will be on the multivariate analysis. The exact contents and emphasis of the course may differ from year to year.

II. Prerequisite

The prerequisite of this course is Econ. 480/580: Introduction to Mathematical Economics, which roughly covers the first 12 chapters of Chiang, A. Fundamental Methods in Mathematical Economics, McGraw-Hill, 3rd ed. The students who feel difficulty in following 680 are encouraged to take Econ. 580, which is offered every summer and semester in the department.

III. Instructor

During the fall of 1987, this course will be taught jointly by Frank Hsiao and Don Roper. The students in the course are reminded that the preliminary examination committee in the field of quantitative methods consist of all the instructors in 680 and 681, and that the examination questions will come equally from these instructors.

IV. Office and Office Hours:

Professor Hsiao
Office EB103, x2-7908
Office Hours: MThWF 10:00-10:50

V. Textbooks

The basic references are reserved at the Norlin Library. Some papers are also available at Kinko's on the University Hill.

Other references are listed on the separate sheets. All of them are available at the Norlin Library (not reserved). We urge you to take a look at at least some of them while you are taking this course.

VI. Basic Reading List

PART I AND PART II: Matrix Theory and Static Analysis
The basic references are
Hsiao, F., Mathematical Programming and Economic Theory, Lecture Notes, Chapters 2-5.

PART III: Introduction to Integration and Dynamics Theory
The basic references for this part are
Roper, D. Lecture Notes
VII. Course Schedule

Part I & II: Matrix Methods and Static Analysis

1 7/14 C9
   C9.5  Review of Unconstrained Optimization Problems
         The Taylor Expansion
2 7/16 C10.7  Exponential and Logarithmic Derivatives
3 7/17 C11;
   C11.3  Quadratic Forms and Applications;
          Eigen-Value Problems
4 7/21 1/2 hour text (15%)
5 7/21 Johnston  Positive Definite Matrices
6 7/23 C12  The Lagrange Method and Bordered Hessians
7 7/24 C12.4  Quasiconcavity and Applications
8 7/27 C12.6  Homogeneity, Homotheticity and Elasticity of
               Substitution
9 7/31 C13
   C13.5  Integral Calculus (C435-458) 13.1-13.4
          The Taylor Expansion
10 8/3 C14
            (C470-479) 14.1-14.2
    C14.  Exponential and Logarithmic Derivatives
    C14  Quadratic Forms and Applications
          (C460-501) 14.3-14.7
11 8/5 C15
    C15  Second Order Differential Equation (C502-522)
           (15.1-15.2)
    C15  1/2 hour test (20%)
12 8/7 C15
    C15  Complex Roots and Econ. Applications
           (C523-548) 15.3-15.7
13 8/10 C16
    C16  Discrete Time: Difference Equations
          (C549-575) 16.1-16.6
14 8/11 C17
    C17  Second Order Difference Equations
          (C576-591) 17.1-17.2
15 8/13 C17
    C17  Applications
8/14 Final Exam (50%) – A Comprehensive Test