Dear Incoming Ph.D. Students,

Welcome to the University of Colorado at Boulder Economics Department. In the fall of 2001, you will begin pursuing a rigorous Ph.D. program in economics. I hope you will find the program enjoyable and fulfilling. I am eagerly waiting to meet you in August 2001 in my two-week Ph.D. Math Preparatory Course (Econ 7800).

Econ 7800 is a compact course on quantitative methods and its objective is to introduce you to the mathematical tools that are used pervasively throughout advanced micro, macro and econometrics courses. In particular, the course intends to prepare you for first year core courses.

You can find the syllabus posted on the university web site and on my home page: http://spot.colorado.edu/~sharmav/. For many of you the course is likely to prove a refresher course, but some of you may find it challenging. I hope the experience will be an invigorating one for all students. Feel free to contact me if you have any question.

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Course Introduction

Econ 7800 is a two-week refresher course on mathematical tools that are pervasively used in economics and is designed to prepare Ph.D. students for studying advanced level courses in microeconomics, macroeconomics, and econometrics. Besides lectures, practice problems will be suggested, but they will not be graded. A study room is being arranged where students can work on practice problems individually or in groups in the afternoon. The course grade will be determined from the final examination that will be given on August 23 during regular class hours.

Tentative Course Schedule

1. Solving Simultaneous Equations Models and Comparative Static: Aug 13, 14
   a. Repeated Substitution Method
   b. Matrix Algebra Method: basic matrix operations, calculating determinants, inverses, Cramer's rule, characteristic roots and vectors
2. Differential Calculus: Aug 15
   a. Concept of Limit, Differentiability, Continuity, Monotonicity, Rules of Differentiation and Partial Derivatives
   b. Total Differential, Implicit Function Theorem
   c. Taylor Series Expansion of a Polynomial Function
   d. Homogeneity, Homotheticity, Euler's Theorem
3. Unconstrained Optimization Technique: Aug 16
   a. Stationary Point, Extreme Value, Convexity/Concavity
   b. First Order and Second Order Conditions for Extreme Value
   a. Equality Constrained Optimization: Substitution Method, Lagrange Multiplier Method
   b. Inequality Constrained Optimization: Kuhn-Tucker Conditions
5. Difference and Differential Equations and Basic Probability Theory: Aug 21, 22
6. Final Examination: Aug 23

1 On August 20 the class will meet from 1 p.m. to 4 p.m., instead of the regular morning hours.
Department of Economics

ECON 7800
(Ph.D. Math Preparatory Course)

Schedule of course offering for Fall 2001

August 13-17
9:00 - 12:00 p.m., Econ 117

August 20
1:00 - 4:00 p.m., Econ 117

August 21
9:00 - 12:00 p.m., Econ 117

August 22 - REVIEW SESSION
9:00 - 12:00 p.m., Econ 117

August 23 - FINAL EXAMINATION
9:00 - 12:00 p.m., Econ 117

Study Sessions Scheduled (optional)
August 13-17, 1:00 - 4:00 p.m, Econ 117
August 20, 9:00 - 12:00 p.m., Econ 117
August 21-22, 1:00 - 4:00 p.m., Econ 117

This course is offered for no credit and does not require formal registration. Students register for the course in the Graduate office (Econ 218). This course is an intensive two-week preparatory course covering integral and differential calculus and optimization techniques. Students are required to take a final examination and pass with a B- or better. Students who fail the examination will be given a second opportunity to pass an equivalent examination two weeks later. The second examination will be announced by the Graduate Office. Students who fail on the second try may be required to take Economics 6808 in the Fall semester.