Department of Economics University of Houston
Ph.D. Math Review Course
Mathematical and Statistical Techniques for Business and Economics
August 2-13, 2004

Instructors

Week 1: Janet Kohlhase, Dept. of Economics, 201-B McElhinney Hall (M), 713-743-3799, email: jkohlhase@uh.edu, URL: http://www.uh.edu/~kohlhase/

Week 2: Nicholas Feltovich, Dept. of Economics, 202-C McElhinney Hall (M), 713-743-3815, email: nfelt@bayou.uh.edu, URL: http://www.uh.edu/~nfelt/

Course Objectives

The goal of the math review course, more affectionately known as "math boot camp," is to ensure that entering Ph.D. students in business and economics have the necessary mathematical background for their first-year courses. Topics covered include set theory, calculus, linear algebra, static and dynamic optimization (Klein ch. 1-15), and probability and statistics (Ramanathan chs. 2, 3, 4, 6). Although attendance is optional, it is highly recommended to all incoming doctoral students in business and economics, even those well-prepared in mathematical techniques.

Schedule and Organization

The math camp meets from 2-4pm Monday through Friday during the weeks of August 2 and August 9, 2004 in room 108 McElhinney Hall (M). Homework problems will be assigned, but not graded. There may also be 2-4 additional hours scheduled for problem review sessions, where an advanced graduate student in economics will go over solutions to the assigned problems.

Assigned Text

Michael W. Klein (K), ***Mathematical Methods for Economics***, 2nd ed., Addison-Wesley, 2002. (note: book is unique to this course. Purchase the book on your own either from the publisher's web site site http://www.aw-bc.com/ or from Amazon at www.amazon.com)

Website to accompany text http://wps.aw.com/aw_klein_mathecon_2/ The website contains a brief math review and has PowerPoint slides corresponding to the text Figures. You should print out Figures to aid note-taking in class.

Other Useful Books (some are on reserve at the M.D. Anderson Library under Econ 4298 Special Problems, Kohlhase section)

Mathematical Economics

Alpha C. Chiang (C), ***Fundamental Methods of Mathematical Economics***, 3rd ed., McGraw-Hill, 1983 (on reserve; this is one of the most popular math econ texts; slightly more difficult than Klein)

Eugene Silberberg, ***The Structure of Economics: a Mathematical Analysis***, 2nd ed., McGraw-Hill, 1990 (on reserve; another classic math econ text at a slightly higher level than Klein; very good on comparative statics; a new 3rd ed., 2001 exists, co-authored with Wing Suen)

Carl. P. Simon and Lawrence Blume, ***Mathematics for Economists***, Norton, 1994 (higher level than Chiang).

Angel de la Fuente, ***Mathematical Methods and Models for Economists***, Cambridge, 2000 (higher level than Simon and Blume).

Knut Sydsaeter, Arne Strom, Peter Berck, ***Economists' Mathematical Manual***, 3rd. ed., Springer, 1999 (a book of useful mathematical formulas used in economics; recommended book for Micro I, Econ 6342)

Probability and Statistics

Ramu Ramanathan, ***Statistical Methods in Econometrics***, Academic Press, 1993 (being recalled for reserve; used in 1st semester econ grad stats course, Econ 6331)

William Greene, ***Econometric Analysis***, 3rd. ed., Prentice-Hall, 1997 (on reserve; see the review chapters about probability and statistics; the newest version, 5th ed., 2003 is the text for 2nd semester finance econometrics course, Fina 8397)

Course Outline (K reading required, C readings optional)

Week 1 Basic Math Econ and Review of Probability and Statistics (Kohlhase)

Basics of Sets and Functions	K 1, 2, 3	(C 1, 10)
Matrix Algebra	K 4, 5	(C 4, 5)
Differential Calculus and Unconstrained Optimization		
Univariate	K 7, 9	(C 6, 7, 9)
Multivariate	K 8, 10	(C 11)
Basic Probability Theory	R 2, 3, 4	
Basic Statistical Theory	R 6	

Homework problems will be assigned during week 1, but will not be graded. Separate discussion sessions may be scheduled for an advanced economics graduate student teaching assistant (TA) to go over solutions.

Week 2 Constrained Optimization, Integral Calculus, Dynamics (Feltovich)

Constrained Optimization	K 11	(C 12, 21)
Integral Calculus	K 12	(C 13)
Difference Equations	K 13	(C 16, 17)
Differential Equations	K 14	(C 14, 15)
Dynamic Optimization	K 15	

Homework problems may also be assigned during week 2, but will not be graded.