

MATH CAMP OUTLINE 2006 (SEP.5-SEP.16)

The Mathematics for Economics Workshop, *Math Camp* for short, is the first step of the first-year Ph.D. curriculum in economics. It runs for two weeks prior to the start of the Autumn Quarter. Math Camp covers the basic mathematical tools that are most commonly used in economics analysis. Math Camp is not oriented towards rigorous theorem proofs, but does not take a merely mechanical cook book approach. Math Camp will selectively present rudimentary but foundational notions in mathematical analysis to facilitate better understanding of the toolbox that we routinely use at the level of the first-year microeconomics courses (Economics 804, 805 and 808).

When we begin E804 (Microeconomics I) in the fall quarter, for example, we assume that you have a working proficiency of the material covered in Math Camp. Professor McCafferty will also assume what you learned well Math Camp when he teaches E701 (Dynamic Optimization). Please note that E701 is directly complementary to dynamic models in the first-year macroeconomics sequence (E806/807/809) and will be offered in the autumn quarter. Math Camp complements, but does not replace, the first-year mathematics (E700/701) and statistics (E640/740/741) courses. In fact, additional topics in real analysis and its applications will be covered in E700, to be offered in either Winter 2007 or Spring 2007 depending on the instructor availability.

The 2006 Math Camp will run from Tuesday, September 5 through Saturday, September 16, and Professor Miyazaki will conduct the entire Math Camp with the assistance of a senior GTA, Mr. Ching-jen Sun. Each day of the Math Camp will consist of 2 hours of morning lecture, 2 hours of early afternoon lecture, and 2 hours of late afternoon discussion section. A new Math Camp syllabus will be available later in the summer.

The Math Camp does not presume that you had high calibre mathematics, but presumes that you have adequate proficiency in the following areas from your undergraduate backgrounds.

- Intermediate Microeconomics
- Intermediate Macroeconomics
- Analytic Geometry
- Linear Algebra
- Vector Calculus
- Elementary Differential Equations

Please do your own self-diagnosis and if you feel deficient in these prerequisite materials, now is the time to undertake rigorous review. You are assumed to have the proficiency in linear algebra and vector (or multivariate) calculus at the level of the first courses offered in a typical mathematics undergraduate curriculum. For example, taking partial derivatives is routine in any graduate level economics course.

To review intermediate microeconomic theory, the best undergraduate textbook is

Hal R. Varian, *Intermediate Microeconomics: A Modern Approach*, Sixth Edition, New York & London: Norton, 2003, ISBN: 0-393-97830-3

For a quick check of your mathematical proficiency at the level of our Math Camp, try Chapter 26 (Mathematics) and Chapter 27 (Optimization) in

Hal R. Varian, *Microeconomic Analysis*, Third Edition, New York & London: Norton, 1992, ISBN: 0-393-95735-7.

For a comprehensive review and refresher course in mathematics, study Parts I, II and III of

Carl P. Simon, and Lawrence Blume, *Mathematics for Economists*, New York & London: Norton, 1994, ISBN 0-393-95733-0.

Even if your mathematical background is very solid, you can still obtain intangible gains from attending Math Camp. In fact, many past participants valued the *esprit de corps* that was formed during the Math Camp. At a more practical level, you will get a head start on knowing your departmental environment and campus neighborhood. The plain fact has been that Math Camp participants seem to gain a momentum to go into and finish the first quarter, which many of our students have felt most challenging of all graduate years. Every year the Math Camp attendance rate has practically been 100% of the entering class in economics.

Please obtain the signature of your Director of Graduate Studies, and send your Math Camp enrollment request to Office of Graduate Studies, Department of Economics. The registration request form is attached to this cover letter. If you wish to participate in our Math Camp, we need to hear from you by July 31. If you plan to take E804 or any part of the micro or macro economics core sequences, you are strongly urged to attend Math Camp.

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The Math Camp Registration Request Form is attached.