

Economics 627
Mathematics for Economics

Fall Semester 2006
Tues/Thurs 12:00-1:15
Miller Hall Room 101

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Office Hours: 11:00-12:00 TR
or by appointment

Texts: Chiang, A.C. and Kevin Wainwright, *Fundamental Methods of Mathematical Economics*, (4th ed.) McGraw-Hill, 2005.

The goal of this course is to prepare you for, or remind you of, the mathematical underpinnings of economic theory courses—Econ 606, 607, 608 and 609. To that end, we will seek to translate undergraduate economic theory topics into the language of mathematics, taking considerable care to develop the necessary mathematical framework and adding a few bells and whistles in the process. In addition, several increasingly important topics in economic theory are inherently mathematical—namely dynamic optimization models that form the basis of macroeconomic growth theory, natural resources exploitation models and other “dynamic” topics. We will cover both the mathematics and economics of these subjects, though only briefly. I would emphasize that this is not a course in mathematical economics—the sub-discipline seeking to extend the frontiers of economic theory in mathematical form.

Ideally, we would cover each topic in this course just in time for the theory courses to use that topic. Inevitably, we will miss the timing on at least some topics. If the theory courses arrive at some topic that requires mathematics we have not yet covered in this course, you will nonetheless be expected to read mathematical appendices or other textbooks for the course to obtain at least an intuitive feel for the mathematics. Of course, you are also welcome to request adjustments in our schedule, and we will try to accommodate.

Evaluation and Grading: Your grade will be based on two midterms (25% each); regular homework assignments (25%); and a final exam (25%). Class participation will be a consideration in marginal cases. Blatant flattery of the instructor probably wouldn't hurt, either. Students are responsible for attending all class meetings, to participate in discussion, to cover material not in the textbook and to receive assignments and announcements about adjustments in the schedule. Homework assignments are due at the beginning of each class period. I will not accept late homework assignments. Make-up exams will not be offered except in the most dire, tragic and **well-documented** circumstances. For the final course grade, I will assign plus/minus modifiers to the standard letter grades.

Disability Access: If you feel you need reasonable accommodations because of the impact of a disability, please: (1) contact the KOKUA Program (V/T) at 956-7511 or 956-7612 in room 013 of the QLCSS; (2) speak with me privately to discuss your specific needs. I will be happy to work with you and the KOKUA Program to meet access needs related to a documented disability. Unhappily, missing one's habitual lunch hour or mid-day nap due to the class meeting schedule is not considered to generate a documentable disability.

Date	Reading Assignment	Topic
08/22	Introduction; recreational complaining	Procrastination
08/26	FM1, FM2, FM3	Equilibrium Analysis
08/29	FM4,5	Comparative Statics
08/31	Handout	Input-output analysis
09/05	FM6,7,8	Comparative statics of general function models
09/07	FM9; handout	Optimization; Maclaurin & Taylor series
09/12	FM10	$\exp(x)$; $\ln(x)$; time in economics
09/14	FM11	Convexity; 2nd order conditions; theory of the firm
09/19	FM12	Constrained optimization; theory household
09/21	FM12	Slutsky equations
09/26	Midterm 1	Midterm I
09/28	FM13	Kuhn-Tucker conditions; envelope theorem; theory of the firm
10/03	FM14	Integration & economic dynamics
10/05	FM15	Continuous time differential equations
10/10	FM16	More differential equations
10/12	FM17	Difference Equations
10/17	FM17	More difference equations
10/19	FM18	Higher order difference equations
10/24	FM19	Simultaneous diff eqns
10/26	Midterm 2	Midterm 2
10/31	Handout	Intro to dynamic optimization problems
11/02		Calculus of variations; Euler equation
11/07	Holiday: Election Day	
11/09	FM20.1	Optimal Control: the maximum principle
11/14	FM20.2, 20.3	Terminal conditions
11/16	FM20.5	Infinite planning horizon; constrained optimization
11/21	FM20	Catching up
11/23	Holiday: Thanksgiving	Thanksgiving Day (thankfully)
11/28		Optimal control continued
11/30	Handout	Natural resource exploitation models
12/05		Natural resource models
12/07	Last class meeting	review
12/14	Final Exam: Miller Hall 101	Thursday December 14, 2006