

SYLLABUS FOR MATHEMATICS FOR ECONOMISTS ECONOMICS 362M, SPRING 2010

MAXWELL B. STINCHCOMBE

ORGANIZATION

Basics: We meet Tuesdays and Thursdays, from 12:30 p.m. to 2:00 p.m. in UTC 3.122. The unique number is 33720.

Reaching me: My office is BRB 2.118, phone number (512)475-8515, my e-mail address is max.stinchcombe@gmail.com. Office hours are Tuesdays and Thursdays, 2:00-3:00 p.m. and Mondays and Wednesdays, 11-11:45 a.m., though the graduate students have priority at that time. You can also drop-in, and/or make an appointment.

Teaching Assistant: We are lucky to have Mohammad Dehghani as the T.A. for this course. His office hours are Mondays and Fridays, 2-3:30 p.m. His e-mail is mhdehghani@gmail.com, his phone is 512-767-9625, and his office is BRB 2.146.

Texts: The required textbook for this class is *An Introduction to Mathematical Analysis for Economic Theory and Econometrics* by D. Corbae, M. Stinchcombe, and J. Zeeman.¹ I strongly advise you to read the material once before we cover it in lecture and once afterward.

Evaluation: There will be weekly homework assignments (40%), consisting of about 8 problems of varying difficulties, two mid-terms, Thursday February 25, 2010 (10%) and Thursday March 25, 2010 (10%), and a final exam, Saturday May 15, 2010, 9 a.m. - 12 p.m. (40%).

In more detail:

- (1) The homework assignments are due every Tuesday beginning January 26, unless this falls during spring break (March 15-20), in which case the assignment is due the following Tuesday.
 - (a) I expect you to get almost all of the homework problems correct. This is because you will have two chances at them. From the time I hand an assignment back to you, you have two weeks to correct any errors on the homework problems. I am very happy to talk about any difficulties you have with the assignments.
 - (b) I strongly encourage you to work together on assignments, and to talk to me about any and all parts of the assignments. However, I strongly

¹The list of typographical errors so far identified is the last page of this syllabus.

discourage you from merely copying someone else's work. If you "free ride" on others' efforts, it is likely that you will not understand what is being taught sufficiently well to pass the class.

- (2) The two mid-terms will each count for 10% of your grade, and they will likely include both an in-class and a homework-like component. They will be given on Thursday February 25 and Thursday March 25. I do not give make-up exams. If you must miss the mid-term on University business, make arrangements with me in advance.
- (3) The final, cumulative exam will be given on Saturday May 15, 2010, from 9 a.m. till 12 p.m. It will count for the remaining 40% of your grade.

Background: I will assume that you have had a good introduction to microeconomics, especially the utility maximization foundation of the theory of consumer choice and the theory of the firm, and that you have a good working knowledge of partial derivatives and differential calculus.

Topics: The course is in introduction to the basics mathematics that is used in essentially all advanced economic analysis. Though it may feel that the tools are central to your experience of this course, it is their usefulness that motivates me to teach this course, and I hope you come to appreciate these as well. We will see these tools used for

- (1) Rational choice theory, which is the basic model of human motivation that economists use.
- (2) Monotone comparative statics, which examines how optima move as circumstances change.
- (3) One factor growth models, which are the basic dynamic models for resource economics and macroeconomics.
- (4) Duality theory, which ties together the different approaches to consumer demand theory and to the behavior of price-taking firms.
- (5) Constrained optimization theory and the Karush-Kuhn-Tucker Theorem, which is the basic tool for analyzing the mathematical model of human behavior that economists use.

Schedule

The intended schedule is given below. If needed, we will adjust it.

| Week | Dates | Chapters |
|------|---------------|----------------------|
| 1 | Jan 19, 21 | Ch. 1, 2.1 - 4 |
| 2 | Jan 26, 28 | Ch. 2.5 |
| 3 | Feb 2, 4 | Ch. 2.6 - 7 |
| 4 | Feb 9, 11 | Ch. 2.8 |
| 4 | Feb 16, 18 | Ch. 2.10, 3.1 - 2 |
| 5 | Feb 23, 25 | Ch. 3.3, Midterm |
| 6 | Mar 2, 5 | 3.3 - 4 |
| 7 | Mar 9, 11 | Ch. 3.4 - 7 |
| — | Spring break | — |
| 8 | Mar 23, 25 | Ch. 4.1 - 2, Midterm |
| 9 | Mar 30, Apr 1 | Ch. 4.2 -3, 5.1 - 2 |
| 10 | Apr 6, 8 | Ch. 5.3 - 4, 4.4 |
| 11 | Apr 13, 15 | Ch. 4.5 - 7 |
| 12 | Apr 20, 22 | Ch. 4.8, 5.5 - 6 |
| 13 | Apr 27, 29 | Ch. 5.7 - 8 |
| 14 | May 4, 6 | Ch. 5.8 - 9 |