Economics 300: Methods and Tools of Economic Analysis

Professor Cramton

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Course description

The methodology of economics employs mathematical and logical tools to model and analyze markets, national economies, and other situations where people make choices. Understanding of many economic issues can be enhanced by careful application of mathematical methods. This course reviews concepts and techniques usually covered in algebra, geometry, and calculus, focusing on those elements most relevant to economic analysis. The course applies these mathematical concepts and techniques to model economic behavior and outcomes.

The course meets twice per week for a *class session* with the professor and then once per week in a *discussion section* with your teaching assistant. Class sessions and readings demonstrate the power of math to answer economic questions, stressing the reasons economists use math and explaining mathematical logic and techniques. Discussion sections demonstrate solutions for problems, answer questions about material presented in the online materials, the book, or the class sessions.

Students should be prepared to devote at least 4 hours per week outside of the class sessions and discussion section, primarily working on problem sets as well as reviewing materials and practicing techniques. *Students with weak math skills will need to spend additional time mastering techniques.*

Course objectives

By the end of the semester each student should be able to:

- Recognize and use the mathematical terminology and notation typically employed by economists
- Explain how specific mathematical functions can be used to provide formal methods of describing the linkages between key economic variables
- Employ the mathematical techniques covered in the course to solve economic problems and predict economic behavior
- Explain how mathematical concepts enable economists to analyze complicated problems and generate testable hypotheses

Pre-requisites

You are responsible for having completed three courses (or their transfer equivalents) with grades of C- or better before taking this course, including: Econ 200 (Principles of Microeconomics), Econ 201 (Principles of Macroeconomics) and either Math 220 (Elementary Calculus I) or Math 140 (Calculus I). If you have already taken Math 141, you should talk with a departmental advisor to ascertain if you should complete Econ 300 or go on to take Math 241.

Course website

www.cramton.umd.edu/courses/econ-300. In addition, grades and other communications will be available at elms.umd.edu. If you are registered for this course, you can use your directory ID and password to access your grades.

Teaching assistant's contact information

Teaching assistants' contact information and office hours are posted on the course website.

Class sessions

Tuesday and Thursday, 11-11:50 am, Marie Mount Hall 1400.

Discussion sections

Each student is registered for a specific discussion section, which meets on Friday. Generally it is fine to go to another section, so long as you go to one with your TA. Before each exam, your TA will schedule a review session, which typically will replace the discussion section that week. Check the schedule.

Email

The University has adopted email as the primary means of communication outside the classroom. Students are responsible for updating their current email address via the appropriate link on www.registrar.umd.edu. New information about the course will be distributed to you via email as well as announcements on the course website.

Software

Wolfram Alpha is a web-based version of an extremely powerful computational program, Mathematica. You can use the free web version; however, I recommend that you subscribe to Wolfram Alpha Pro, which is $2.99 per month for students. (For the most advanced use, you would want the full desktop version of Mathematica. See www.oit.umd.edu/slic/howto/homeuse.html. Most students in Econ 300 will find that Wolfram Alpha Pro or even the free version is sufficient for their needs.)

Problem sets

There are six problem sets. All problem sets are posted on the class website. Problem sets are to be handed in in hard copy at the beginning of your discussion session on the date due. If for some reason you cannot hand it in at that time, please put it in the Econ 300 mailbox before your discussion session; *do not put problem sets in the professor's mailbox*. The Econ 300 mailbox is in the Econ Dept office in Tydings. *Late problem sets will not be accepted.* Problem sets are graded on a four point scale: 4 excellent, 3 good, 2 fair, 1 poor, 0 not attempted. Answers will be posted on the course website shortly after discussion section ends. The problem set with the lowest score will be dropped. Thus, you should not worry if an emergency, illness, or other matter prevents you from turning in one problem set when due—just be sure to hand in the others. Your answers should be your own. You may use Mathematica or Wolfram Alpha. However, it is a violation of the University's Code of Academic Integrity to consult past problem set solutions or copy the work of another.

Math in subsequent economics classes

A main objective of this course is to prepare you to be able to handle the math in the advanced economics classes you will take in later years. Many of the problems in this course are taken from problem sets and previous exams from a number of 400-level economics classes. Pay attention; you may see these problems again.

Recommended textbook

Michael W. Klein, *Mathematical Methods for Economics*, Addison-Wesley. It is fine to rent or get a used copy. It is also fine to get the University of Maryland customized version: Michael, W. Klein, *Methods and Tools of Economic Analysis*. I recommend getting whichever is least expensive. You should check at Amazon. Any edition (first or second) or format (hardback or paperback) is fine. We *will not* use the bundled software, so don't pay extra for that.

Expectations of students

You are expected to attend the class sessions and discussion section, fully utilize the course materials, complete problem sets on time, and every week check the course website for updated information. You are expected to read assigned materials before the class session. Research shows that students who actively participate in class tend to learn significantly more than those who only passively listen. You should ask questions, articulate your ideas and concerns, and if you find that you cannot follow the material please attend office hours of your teaching assistant.

Students with learning disabilities should get in touch with their assigned TAs as soon as possible to make arrangements for exams.

Grades and assignments

Your grade will be determined by your performance on the following assignments, weighted as indicated.

Department of Economics' policy on grading requires instructors to use the grading system announced at the beginning of the semester in all cases. I cannot make any exceptions to that rule. There will be no opportunity for extra credit after the semester ends.

Problem sets	10%
First midterm exam	25%
Second midterm exam	25%
Final exam	40%
Total	100%

Schedule of class sessions, exams, and due dates

The dates for class sessions, exams, and problem sets are posted on the course website. All dates are subject to change.

Exams

All exams will be given in the classroom. Exams will use a multiple choice format. You may bring to the exam an 8.5" x 11" *cheat sheet* (two-sided) with any formulas, definitions, etc., that the you think will be helpful in the exam. Not all material from the text will be covered on the exams; in contrast, all material covered in class sessions and discussion sections may be covered on the exams.

Calculator

You will need a calculator for exams. In addition to standard functions, your calculator must have functions for general exponents, logs, and the exponential function. Note that wireless enabled devices, cell-phones, programmable calculators, and notebook computers cannot be used during exams.

Legal excuses for missing an exam

If you anticipate missing an exam because of a religious observance or participation in University activities at the request of a University official, you must inform your TA within the first three weeks of the semester. If you miss an exam because of illness that can be documented by a medical professional, you must inform your TA as soon as possible, preferably in advance of the exam, and a make-up exam will be scheduled. If you miss a midterm exam for any other reason, then you can take a make-up at a time selected by your TA, and you will automatically lose 25% of the maximum points possible for that exam. If you fail to show up for the make-up, then you will earn a zero for that exam. If you miss the final exam without a valid excuse, the 25%-deduction make-up option does not apply, and your score will be a zero. Note: make-up exams are not given for students whose travel plans conflict with the date of the scheduled final.

Academic integrity

The University of Maryland has a nationally recognized Code of Academic Integrity, administered by the Student Honor Council. This Code sets standards applicable to all undergraduate students, and you are responsible for upholding these standards as you complete assignments and take exams in this course. Please make yourself aware of the consequences of cheating, fabrication, and plagiarism. For more information see www.shc.umd.edu.