

# Syllabus

## Econ 1088 - 001 Math Tools for Economists II Fall 2006

**Instructor:** Tianle Zhang (I am currently a Ph.D. student in Economics Department.)

**Class Hours:** TR 5:00 - 6:15 pm

**Class location:** HLMS 201

**Office:** Econ 307

**Office Hours:** Tuesday 3:30-4:45pm, Thursday 3:30-4:45pm and by appointment

**Office Phone:** 303-492-7617

**E-mail:** [tianle@colorado.edu](mailto:tianle@colorado.edu) (preferred method of contact)

**Course Website:** <http://ucsu.colorado.edu/~tianle>

**1088 Common Website:** <http://www.colorado.edu/economics/courses/ECON1088/1088home.html>

**Course Description:** This class is a continuation of ECON 1078. It introduces the math tools which will help you to better understand the mathematical framework on which economics models are based. The class time will be mainly spent on lecturing and problem solving.

### **Prerequisite:**

Econ 1078 or equivalent

**Textbooks Required:** Knut Sydsaeter and Peter Hammond, "Essential Mathematics for Economic Analysis", Second edition (You will be expected to have, and know, this book throughout your undergraduate career as an economics major.)

### **Homework:**

Homework will be assigned weekly so that you can practice with the new material. This homework will not be graded.

### **Quizzes:**

In addition to homework, quizzes will be given weekly which will test the knowledge of the homework problems. These are graded. The two lowest quizzes will be dropped at the end of the semester. As such no make up quizzes will be provided.

### **Exams:**

Three midterms will be given and one comprehensive final. All exams are given in the classroom. The lowest of the exams will be dropped. Again, this means that no make up exams will be granted. The final will not be dropped.

Midterm 1 Tuesday September 26, 2006

Midterm 2 Tuesday October 31, 2006

Midterm 3 Tuesday December 5, 2006

Final Exam (7:30-10:00pm) December 19, 2006

### **Grading:**

Top N-2 quizzes will make up 20% of your grade

Top 2 Midterms will make up 50% of your grade (25% each)

Cumulative Final will make up 30% of your grade

### **Letter Grading:**

90-100 A

80-89 B  
70-79 C  
60-69 D  
Below 60 F

**Tentative Course Outline**

***Chapter 6 Differentiation:***

6-1 Slopes of Curves  
6-2 The derivative. Tangents  
6-3 Increasing and Decreasing Functions  
6-4 Rates of Change  
6-5 A Dash of Limits  
6-6 Simple Rules for Differentiation  
6-7 Sums, Products, and Quotients  
6-8 Chain Rule  
6-9 Higher Order Derivatives  
6-10 Exponential Functions  
6-11 Logarithmic Functions

***Chapter 7 Derivatives in Use:***

7-1 Implicit Differentiation  
7-2 Economic Examples  
7-3 Differentiating the Inverse  
7-4 Linear Approximations  
7-5 Polynomial Approximations  
7-6 Taylor's Formula  
7-7 Why Economists Use Elasticities  
7-8 Continuity  
7-9 More on Limits  
7-10 Intermediate Value Theorem and Newton's Method  
7-11 Infinite Sequences  
7-12 L'Hopital's Rule

***Chapter 11 Functions of Many Variables:***

11-1 Functions of Two Variables  
11-2 Partial Derivatives with Two Variables  
11-3 Geometric Representation  
11-4 Surfaces and Distances  
11-5 Functions of More Variables  
11-6 Partial Derivatives with More Variables  
11-7 Economic Application  
11-8 Partial Elasticities

***Chapter 12 Tools for Comparative Statics:***

12-1 A Simple Chain Rule  
12-3 Implicit Differentiation along a Level Curve  
12-5 Elasticity of Substitution  
12-8 Linear Approximations  
12-9 Differentials

***Chapter 13 Multivariable Optimization:***

13-1 Two Variables – Necessary Conditions  
13-2 Two Variables – Sufficient Conditions  
13-3 Local Extreme Points  
13-4 Linear Models with Quadratic Objectives  
13-5 The Extreme- Value Theorem  
13-6 Three or More Variables

## 13-7 Comparative Statics and the Envelope Theorem

### **Chapter 14 Constrained Optimization:**

We will cover this in detail commensurate with available time

#### **General policies:**

- 1) It is the students' responsibility to take control of their own education. If you are having problems, I am more than willing to help you. You just need to approach me at some point.
- 2) No make-ups will be given unless there is a proven emergency that prevents you from attending class on the scheduled exam date. You are required to submit proof of the emergency. If you miss an exam or a quiz, you will be given a zero.
- 3) All students of the University of Colorado at Boulder are responsible for knowing and adhering to the academic integrity policy of this institution. Violations of this policy may include: cheating, plagiarism, aid of academic dishonesty, fabrication, lying, bribery, and threatening behavior. All incidents of academic misconduct shall be reported to the Honor Code Council (honor@colorado.edu; 303-725-2273). Students who are found to be in violation of the academic integrity policy will be subject to both academic sanctions from the faculty member and non-academic sanctions (including but not limited to university probation, suspension, or expulsion). Other information on the Honor Code can be found at <http://www.colorado.edu/policies/honor.html> and <http://www.colorado.edu/academics/honorcode/>  
***Honor Code: "On my honor, as a University of Colorado at Boulder student, I have neither given nor received unauthorized assistance on this work."***
- 4) If you qualify for accommodations because of a disability, please submit to me a letter from Disability Services in a timely manner so that your needs may be addressed. Disability Services determines accommodations based on documented disabilities. Contact: 303-492-8671, Willard 322, and [www.Colorado.EDU/disabilityservices](http://www.Colorado.EDU/disabilityservices).
- 5) Campus policy regarding religious observances requires that faculty make every effort to reasonably and fairly deal with all students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. Students can see full details at [http://www.colorado.edu/policies/fac\\_relig.html](http://www.colorado.edu/policies/fac_relig.html)
- 6) Students and faculty each have responsibility for maintaining an appropriate learning environment. Students who fail to adhere to behavioral standards may be subject to discipline. Faculty has the professional responsibility to treat students with understanding, dignity and respect, to guide classroom discussion and to set reasonable limits on the manner in which