

**UNIVERSITY OF COLORADO AT BOULDER**  
**Department of Economics**

**Course Syllabus**

**ECON 1088-001 Math Tools for Economists II**

**Spring 2008**

**Instructor:** Watcharapong Ratisukpimol

**Class Meetings:** MWF 2:00-2:50 PM

**Class Location:** BESC 185 (Benson Earth Sciences)

**Office:** ECON 401 (3<sup>rd</sup> floor of ECON building)

**Office Phone:** (303)-492-7116

**Office Hours:** MWF 11:00 AM - 12:00 PM or by appointment

**Webpage:**

<http://ucsu.colorado.edu/~ratisukp>

The webpage is the most important resource for this class. All notes, quizzes, exams and answer keys are going to be posted on this site. It is your responsibility to check any updated information from the class webpage.

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

This is a joint webpage of ECON 1088 instructors. It is provided as a supplement to the course materials for ECON 1088. We, all ECON 1088 instructors, maintain the page to provide questions, quizzes, and handouts so that students can access to the materials of other instructors.) Moreover, you can find homework and exams from previous semesters here.

**E-mail:** [watcharapong.ratisukpimol@colorado.edu](mailto:watcharapong.ratisukpimol@colorado.edu) (preferred method of contact and please include "ECON 1088" in subject of the e-mail.)

**Class Time:** January 14<sup>th</sup> – May 2<sup>nd</sup>, 2008

**Course Description:**

This course provides an introduction to fundamental mathematics, which are essential to analyze economic problems. It is the second course in a two-course sequence. This course is a continuation of ECON 1078. The goal of this class is to provide students with the mathematical tools for future courses in economics. Basically, it consists of derivatives and optimization. These tools will help you to better understand the mathematical framework on which economic models are based. We will start with a review of ECON 1078, limits and derivative, the rules of differentiation, optimization in the case of single variables and many variables. Economic applications will also be introduced. For the complete list of topics, see the

course outline below. The class consists of lectures, quizzes and in-class discussion that enhance understandings of the materials.

**Prerequisite:** ECON 1078 or equivalent

**Required Textbook:**

*Essential Mathematics for Economic Analysis*, 2<sup>nd</sup> edition,  
Knut Sydsaeter and Peter Hammond

Note that this textbook is the official mathematics reference book for your undergraduate career as Economics major. All of the faculty will assume that you have a copy of the book and know its content. You are expected to keep this book until you graduate.

**Grading:**

Grades will be determined on the basis of your performance on quizzes, homeworks, 3 midterms, and a cumulative final exam. Quizzes are 15-20-minutes in-class individual quiz. **Your TWO lowest quiz-grades will be dropped.** The quiz grade is worth 20% of your overall grade. No make-up quiz is given if you miss the class on that day.

The midterms will be administered on February 13<sup>th</sup> (Wednesday), March 12<sup>th</sup> (Wednesday) and April 9<sup>th</sup> (Wednesday) in class. Each test is worth 15% of the course grade. The midterms are not cumulative and will cover only the material since the previous test. **The lowest in-class midterm grade will be dropped.** If you miss the exam for some reason, there will be no make-up exam.

The final exam is **compulsory** and **cumulative**. It is scheduled on May 3<sup>rd</sup> (Saturday) from 1:30 PM to 4:00 PM. The final exam is worth 40% of your grade. No make-up tests will be given for final unless you talk to the instructor in advance. It cannot be replaced with any other exam under any circumstances. You can only rearrange your final if you have **three or more** finals on the same day.

**Evaluation:**

Homeworks	10%
Quizzes	20%
Midterm Exam 1	15%
Midterm Exam 2	15%
Midterm Exam 3	15%
Cumulative Final	40%

**Exam Schedule:**

Exam	Date
Midterm Exam 1 (In-Class)	February 13 <sup>th</sup> , 2008 (Week 5)
Midterm Exam 2 (In-Class)	March 12 <sup>th</sup> , 2008 (Week 9)
Midterm Exam 3 (In-Class)	April 9 <sup>th</sup> , 2008 (Week 13)
Final Exam (In-Class)	May 3 <sup>rd</sup> , 2008 (1:30-4:00 PM)

Final grade will be assigned based on a following scale but I reserve the right to curve the grades.

100-93%	A	73-76%	C
90-92%	A-	70-72%	C-
87-89%	B+	67-69%	D+
83-86%	B	63-66%	D
80-82%	B-	60-62%	D-
77-79%	C+	0-59%	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
- 7-7 Why Economists Use Elasticities

#### ***Chapter 8 Single-Variable Optimization:***

- 8-1 Introduction
- 8-2 Simple Tests for Extreme Points
- 8-3 Economic Examples
- 8-4 The Extreme-Value Theorem
- 8-5 Further Economic Examples
- 8-6 Local Extreme Points
- 8-7 Inflection Points

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

- 11-1 Functions of Two Variables
- 11-2 Partial Derivatives with Two Variables
- 11-5 Functions of More Variables
- 11-6 Partial Derivatives with More Variables
- 11-7 Economic Application
- 11-8 Partial Elasticities

#### ***Chapter 13 Multivariable Optimization:***

We will cover this in detail commensurate with available time

**Additional Notes:**

- Office hours are held for your benefit. You are highly encouraged to come to my office hours with prepared questions. As it is seen from my experience, students who come to the office hours usually do better in this course.
- You are encouraged to work with your classmates. Study group is strongly recommended. Try to find your group members at the beginning of the semester.
- Make sure to check the webpage before going to the class. I will usually update the webpage every weekend. So please check it and notice my announcement.
- Doing homework and exercises from the textbook will help you learn how to use mathematical tools and familiarize you with problem solving techniques. For take-home quiz, you are encouraged to work in a group but must turn in answer sheets individually. The solution will be posted on the class webpage after the due date.
- If you have three or more final examinations on the same day, you can arrange to take the LAST EXAM scheduled that day at an alternated time. It is your responsibility to notify me no later than six weeks into the semester. You are expected to provide evidence that you have three or more examinations to qualify for exceptions.
- After each exam, the grade will be posted. It is also your responsibility to verify your grades and inform me as soon as possible if there is any incorrectness.
- Lastly, if you are having problems in lessons, I am more than willing to help you. You just need to approach me either after the lecture's class time or during my office hours.

**Policies:****Mobile Phones, Laptops, Newspapers and Other Class Distractions:**

Please turn off all mobile phones and other electronic devices that may disrupt the class. Disruptive electronics and behavior will not be tolerated. Disruptive behavior includes, but is not limited to, reading the newspaper or magazine, working on your laptop, working on homework or reading for other classes, talking to classmates, listening to headphones, text messaging, playing with your pets, etc.

**Expectations of Classroom Behavior:**

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. Faculties have 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 students express opinions.

See policies at <http://www.colorado.edu/policies/classbehavior.html> and at [http://www.colorado.edu/studentaffairs/judicialaffairs/code.html#student\\_code](http://www.colorado.edu/studentaffairs/judicialaffairs/code.html#student_code)

**Honor Code:**

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 at <http://www.colorado.edu/academics/honorcode/>

**Religious Observance Policy:**

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. Please notify me as soon as possible so that the proper arrangements can be made. Students can see full details at

[http://www.colorado.edu/policies/fac\\_relig.html](http://www.colorado.edu/policies/fac_relig.html)

**Disabilities Statement:**

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 <http://www.Colorado.EDU/disabilityservices>. Time extensions for exams must be approved prior to the exam. If you have not talked to me personally prior to the exam you will not be granted an extension. Disability Services' letters for students with disabilities indicate legally mandated reasonable accommodations. Other letters/requests you may receive from agencies such as the Wardenburg Health Center, or other health providers (physicians or counselors) are not necessarily legal mandates. The syllabus statements and answers to Frequently Asked Questions can be found at <http://www.colorado.edu/disabilityservices>

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