

# MATHEMATICAL TOOLS FOR ECONOMICS

## ECON 1078-001 – SPRING 2012

**Instructor:** Hakon Skjenstad  
**Class Time:** M, W, F, 12:00-12:50pm  
**Classroom:** DUAN G125  
**Email:** hakon.skjenstad@colorado.edu  
**Course Website:** CULearn  
**Office:** ECON 401 (North Tower Office in Econ Building)  
**Office Hours:** M 12:50pm-2pm, W 12:50pm-2pm, by appointment  
**Textbook:** *Essential Mathematics for Economic Analysis* 3rd ed.  
by K. Sydsaeter and P. Hammond.

### TEXTBOOK (REQUIRED)

*Essential Mathematics for Economic Analysis* 3rd ed. by K. Sydsaeter and P. Hammond; publisher Prentice Hall.

The book is available from the CU bookstore or online, for example at Amazon or eBay. Your cheapest option is probably half.com:

<http://product.half.ebay.com/W0QQprZ70918426> but be sure to read the reviews on the sellers if you get it from there since you are buying it from individual sellers but not a big online store (like Amazon is).

### COURSE DESCRIPTION

This is the first Mathematical course for many of you at the college level. You will find that the topics are covered much faster and that the problems you are required to solve are more difficult than compared to upper level classes in high school. It is important to practice homework regularly and work on problems even if you do not perfectly understand the material at first look. My goal with this course is to teach you how to learn math! It is a special skill to learn math and think mathematically, and it has very little to do with a natural ability. It is a skill that is not only useful for learning mathematics but one that makes you better at deductive reasoning and spotting logical fallacies in any field of study.

### COURSE LEVEL & PREREQUISITES

This course is an introductory mathematics course at the COLLEGE LEVEL. This means that even if no prerequisites are required this course will be very difficult for you if you have not had any higher level mathematics courses before on the high school or college level. People in the class have very different levels of preparation so if you have very little math background you should realize you are taking tests with people that are much more trained in mathematics than you are. This is not meant to scare you off, but to make you understand that a lot of work is required if you have not seen any of the topics covered before.

### HOW TO STUDY FOR THIS COURSE

Read each chapter before coming to class to get more out of the lectures. We will go quickly over topics in the lectures and there will not be a lot of time to digest new

material during lecture. Therefore I recommend skimming the textbook before each lecture on the relevant material and again when you are doing the assigned problems from the book. Learning mathematics requires allowing yourself enough time to understand the concepts and most importantly by practicing a lot!

Remember: “He who asks a question is a fool for 5 minutes. He who does not ask a question remains a fool forever” –Chinese proverb

## GRADING

Your grade in this course will depend upon your performance in exams and how well you do your homeworks and class assignments. There will be 3 midterms and 10 problem sets. In-class assignments will not be announced ahead of time but the lowest in-class assignment grades will be dropped.

The lowest of the midterm grades will be dropped; so if you miss a test or perform very badly on one that grade will simply be dropped.

The grade breakdown is as follows:

<b>Midterm 1</b>	20%	→	<b>Best Two Midterms</b>	40%
<b>Midterm 2</b>	20%		<b>Homework</b>	25%
<b>Midterm 3</b>	20%		<b>Class Participation</b>	5%
			<b>Final Exam</b>	30%
			<b>Total</b>	100%

Some important things regarding the grading and exams:

- There are no make-up exams.
  - If you miss one, that will be the grade that is dropped.
  - If you miss more than one exam you will get a 0% score for at least one of the midterms you missed.
- Homework assignments can only be handed in in class. If you can't come find a way to get your assignment to class that day (give it to a friend, or classmate).
- There are no make-up homeworks.
  - If you miss one, it will lower your homework grade accordingly.
- Each midterm exam is curved as needed. There will be no further curving of grades at the end of the semester.
- The final exam cannot be dropped for any reason. If you have 3 finals or more on the day of the final exam you need to contact me by email at least 4 weeks before the test so arrangements can be made for a different final exam time.
- Graphing calculators and cell phones are NOT allowed as calculators in any test. Secure yourself a simple calculator or a scientific calculator with no graphing abilities early on in the semester so you do not run in the trouble of not having one when the first test comes around.

## TENTATIVE COURSE SCHEDULE

Date	Topic	Readings	Assignments
<b>Week 1</b>			
Jan 16	<b>No class – MLK day</b>		
Jan 18	Set Theory	3.6	
Jan 20	Integers, Real Numbers	1.1, 1.2	
<b>Week 2</b>			
Jan 23	Algebra Basics	1.2, 1.3	
Jan 25	Algebra Basics, Fractions	1.3, 1.4	
Jan 27	Fractional Powers	1.5	
<b>Week 3</b>			
Jan 30	Fractional Powers, Inequalities	1.5, 1.6	HW1 due
Feb 1	Intervals & Absolute Values	1.6, 1.7	
Feb 3	Solving Equations	2.1	
<b>Week 4</b>			
Feb 6	Solving Equations	2.1	HW2 due
Feb 8	Equations with Parameters	2.2	
Feb 10	Quadratic Equations	2.3	
<b>Week 5</b>			
Feb 13	Quadratic Equations	2.3	HW3 due
Feb 15	Linear Equations in Two Unknowns	2.4	
Feb 17	Non-linear Equations, Exam Review	2.5	
<b>Week 6</b>			
Feb 20	Exam Review		HW4 due
Feb 22	<b>Midterm 1 (in class)</b>		
Feb 24	Basic Graphing Functions	4.1, 4.2	
<b>Week 7</b>			
Feb 27	Graphs of Functions	4.3	
Feb 29 (!)	Linear Functions	4.4	
Mar 2	Linear Functions, Linear Models	4.4, 4.5	
<b>Week 8</b>			
Mar 5	Linear Models	4.5	HW5 due
Mar 7	Quadratic Functions	4.6	
Mar 9	Polynomials	4.6, 4.7	
<b>Week 9</b>			
Mar 12	Polynomials	4.7	HW6 due

Mar 14	Power Functions, Exponential Functions	4.8, 4.9	
Mar 16	Logarithmic Functions	4.10	
<b>Week 10</b>			
Mar 19	Exam Review		HW7 due
Mar 21	<b>Midterm 2 (in class)</b>		Professor's birthday as well
Mar 23	<b>NO CLASS</b>		SPRING BREAK YAY!
<b>Week 11</b>			
Mar 26	Spring Break		
Mar 28	Spring Break		
Mar 30	Spring Break		
<b>Week 12</b>			
Apr 2	Shifting Graphs	5.1	
Apr 4	New Functions from Old	5.2	
Apr 6	Inverse Functions, Supply-Demand	5.3, 4.5	
<b>Week 13</b>			
Apr 9	Graphs of Equations	5.4	HW8 due
Apr 11	Distance in the Plane, Circles	5.5	
Apr 13	Circles, Summation Notation	5.5, 3.1	
<b>Week 14</b>			
Apr 16	Summation Notation, Rules for sums	3.1, 3.2	HW9 due
Apr 18	Rules for Sums, Pascal's triangle	3.2	
Apr 20	Double Sums	3.3	
<b>Week 15</b>			
Apr 23	Exam Review, FCQ administration		HW10 due
Apr 25	Exam Review		
Apr 27	<b>Midterm 3 (in class)</b>		
<b>Week 16</b>			
Apr 30	Final Exam Review		
May 2	Final Exam Review		
May 4	Final Exam Review		
<b>May 9 (Wed)</b>	<b>FINAL EXAM (Cumulative) 4:30pm-7:00pm in the regular classroom</b>		

## **OTHER INFORMATION**

### **Disability Policy:**

If you qualify for accommodations because of a disability, please submit a letter from Disability Services to me 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>.

### **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. If you have a conflict, please contact me at the beginning of the semester so we can make proper arrangements.

### **Classroom Behavior Policy:**

Students and faculty each have responsibility for maintaining an appropriate learning environment. Students who fail to adhere to such behavioral standards may be subject to discipline. Faculty have the professional responsibility to treat all students with understanding, dignity and respect, to guide classroom discussion and to set reasonable limits on the manner in which they and their students express opinions. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with differences of race, culture, religion, politics, sexual orientation, gender variance, and nationalities. Class rosters are provided to the instructor with the student's legal name. I will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me of this preference early in the semester so that I may make appropriate changes to my records.

### **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](mailto: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). See <http://www.colorado.edu/policies/honor.html>  
<http://www.colorado.edu/academics/honorcode>.

### **Discrimination & Harassment Policy:**

The University of Colorado at Boulder policy on Discrimination and Harassment

(<http://www.colorado.edu/policies/discrimination.html>, the University of Colorado policy on Sexual Harassment and the University of Colorado policy on Amorous Relationships applies to all students, staff and faculty. Any student, staff or faculty member who believes s/he has been the subject of discrimination or harassment based upon race, color, national origin, sex, age, disability, religion, sexual orientation, or veteran status should contact the Office of Discrimination and Harassment (ODH) at 303-492-2127 or the Office of Judicial Affairs at 303-492-5550. Information about the ODH and the campus resources available to assist individuals regarding discrimination or harassment can be obtained at <http://www.colorado.edu/odh>.