

**University of Colorado at Boulder**  
**Math Tools for Economists I**  
**ECON 1078-002**

**MEETING TIME:** MWF 2:00-2:50 p.m.  
**ROOM:** RAMY N1B23

**Instructor:** Yuchen Shao  
**Office:** ECON 306  
**E-mail:** yuchen.shao@colorado.edu  
**Web:** <https://learn.colorado.edu/>  
**Office Hours:** M 3:00 p.m. – 5:00 p.m. or by appointment

**Textbook:**

*Essential Mathematics for Economic Analysis, 3rd*, by Knut Sydsaeter, and Peter Hammond. You will also use this book for ECON1088. Since you can always refresh your knowledge of algebra and calculus by referring to this book, *please keep it as your reference book for undergraduate courses.*

**Resources:**

<http://www.colorado.edu/economics/courses/ECON1078/1078home.html>

This is the joint website for all Econ 1078 instructors. You can find homework and exams from previous semesters here.

**Course Description and Objectives:**

The goal of this course is to provide students the basic mathematical tools needed for business and economics. The materials covered in this course include: rules of algebra, solving linear and nonlinear equations, essentials of set theory, logical proof and functions, and matrix. For a complete list of topics see the course schedule that follows.

“Learning by doing” is important in math classes. There are a lot of practice questions in the textbook. Some of them will be selected as problem sets. From problem sets, you will learn how to apply formulas and properties in real question and be prepared for tests. In addition, some examples not in the book but related to economics will be discussed during class time.

**Attendance policies:**

Attendance is **COMPULSORY** and regularly attending classes will definitely help your performance and grade. I will reward extra credits to those actively participate in discussion.

Handouts for each lecture will **ONLY** be distributed in class and will **NOT** be posted on course website. These are outlines of class materials but not substitution of your textbook or class notes. You are responsible for any missing class. If you miss any class, please borrow notes from others and read the materials **BEFORE** going to my office hours.

### **Grading:**

Your grade will come from the following breakdown:

10% - In-class Assignments

25% - Homework

40% - Midterms (Top 2 out of 3 scores)

25% - Final

Randomly throughout the semester I will assign problems for you to work on in class, which you should hand in the solutions before you leave. These problems are group projects intended to provide practice and will be similar to those you will see on quizzes and exams. There will be **NO** make-up for any in-class assignment without formal documentation, like doctor's note. Personal reasons like friends' wedding, family trip, and football game are not excuses for makeup.

There will be totally 5 problem sets posted on the course website during the semester. Please check the tentative schedule below for the due dates. I will grade it carefully as from 0 to 5 points. For any late hand-in of homework, I will deduce exactly 2 points from the score you initially earn, even if it is already a zero point.

The midterms will be administered in class. The midterms are not cumulative and will cover only the material since the previous test. **If you miss more than 2 midterm exams for whatever reason, the weight of that exam will carry over onto the final, so there will be NO MAKEUP midterms.**

The final exam is **cumulative**. It is scheduled on **Dec 17 (Monday)** from **4:30 p.m. to 7:00 p.m.** To qualify for rescheduling the final exam time, you must provide evidence that you have three or more exams on the same day and ECON 1078 is the **last** one before *Friday, October 5th!* Otherwise, there will be **NO MAKEUP** final.

I may curve the grades of midterms but will not curve your final. So you are able to estimate your letter grade by the grading scale. All scores are posted on the course website.

### Grading Scale:

93% to 100% A

90% to 92% A-

88% to 89% B+

82% to 87% B

80% to 81% B-

78% to 79% C+

72% to 77% C

70% to 71% C-

68% to 69% D+

62% to 67% D

60% to 61% D-

59.5% or lower F

**Tentative Course Schedule:**

*Please mark those important dates on your calendar!*

Week	Date	Topics	Course Materials	Assignments
1	Aug 27	1.1	Real Numbers	
	Aug 29	1.2	Integer Powers	
	Aug 31	1.3	Rules of Algebra	
2	Sep 3	<b>No class</b>	<i>Labor Day Holiday</i>	
	Sep 5	1.4	Fractions	
	Sep 7	1.5	Fractional Powers	
3	Sep 10	1.6	Inequalities	
	Sep 12	1.7	Intervals, Absolute Value	
	Sep 14	2.1	Simple Equations	HW1 DUE
4	Sep 17	2.2	Equations with Parameters	
	Sep 19	2.3	Quadratic Equations	
	Sep 21	2.4	Linear Equations in Two Unknowns	
5	Sep 24	2.5	Non-linear Equations	
	Sep 26	Review	Chapter 1 & 2	
	Sep 28	<b>Midterm 1</b>		HW2 DUE
6	Oct 1	4.2	Basic Definitions	
	Oct 3	4.3	Graphs of Functions	
	Oct 5	4.4	Linear Functions	
7	Oct 8	4.5	Linear Models	
	Oct 10	4.6	Quadratic Functions	
	Oct 12	4.6		
8	Oct 15	4.7	Polynomials	
	Oct 17	4.8	Power Functions	
	Oct 19	4.9	Exponential Functions	
9	Oct 22	4.10	Logarithmic Functions	
	Oct 24	Review	Chapter 4	
	Oct 26	<b>Midterm 2</b>		HW3 DUE
10	Oct 29	5.1	Shifting Graphs	

	Oct 31	5.2	New Functions From Old	
	Nov 2	5.3	Inverse Functions	
11	Nov 5	5.4	Graphs of Functions	
	Nov 7	15.1	Systems of Linear Equations	
	Nov 9	15.2	Matrices	
12	Nov 12	15.3	Matrix Multiplication	
	Nov 14	15.4	Rules	
	Nov 16	15.5	Transpose	HW4 DUE
13	Nov 19-23	<b>No class</b>	Fall Break & Thanksgiving	
14	Nov 26	15.6	Gaussian Elimination	
	Nov 28	Review	Chapter 5 & 15	
	Nov 30	<b>Midterm 3</b>		
15	Dec 3	3.1	Summation	
	Dec 5	3.2	Rules for Sums	
	Dec 7	3.3	Double Sums	
16	Dec 10	3.6	Set Theory	
	Dec 12	Review		HW5 DUE
	Dec 14	Review		
<b>Final Exam (Cumulative): Monday Dec 17, 4:30 p.m. – 7:00 p.m.</b>				

### Calculator Note:

As this is a course designed to teach mathematical techniques you will need a calculator that can do basic mathematical functions. These include exponentials, logarithms, radicals, and factorials ( $\log$ ,  $\ln$ ,  $e^x$ ,  $n\sqrt{\quad}$  and  $x!$ ). Any basic scientific calculator will perform these functions. While a graphing calculator may be useful in doing some of the homework problems, **you cannot use a graphing calculator on the exam**. This is the policy for all economic courses. If you don't have a basic calculator, it would be better if you buy one.

### Disability

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>

### Religious Holidays

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 any of the scheduled exams in this syllabus conflicts with your religious holiday(s), notify me within the first two weeks of classes so that I can accommodate you as reasonably as I can in accordance with the above stated policy.

### ***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). 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/>

### ***Policy on Discrimination and Sexual Harassment***

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 apply 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 harassment can be obtained at <http://www.colorado.edu/od>