

ECON 1078-002 MATHEMATICAL TOOLS FOR ECONOMISTS 1

University of Colorado Boulder
Department of Economics
Spring 2022

Instructor:	Ge Song	Time:	MWF 1:25 – 2:15 PM
Email:	Ge.Song@Colorado.EDU	Place:	ECON 119
Office:	Zoom Meeting	Office Hours:	MF 2:40 – 3:40 PM

Course Pages: <https://cuboulder.instructure.com/courses/81709>

Lecture Zoom Link: <https://cuboulder.zoom.us/j/96895501810>

Office Hour Zoom Link: <https://cuboulder.zoom.us/j/98390167568>

The course syllabus, handouts, supplementary materials, and homework assignments will be posted on Canvas. Please check the course webpage frequently as I will be updating it with materials and assignments. You are responsible for checking the canvas webpage regularly to avoid missing any assignments or announcements.

Office Hours: Monday and Friday 2:40 – 3:40 PM, or by appointment.

Course Description: This is a one-semester course on mathematical tools that are frequently used by economists. In this course, things will be built up gradually. Topics covered in this course include basic college-level algebra, simple linear and nonlinear equations, functions and their graphs, systems of equations, set theory, summation, logic and proofs. With the introduction of the necessary contents above, the course aims to cement a solid foundation for your future learning of economics and business courses. In terms of teaching pedagogy, one of the class activities that will be visited and revisited throughout the course is to establish the linkages among figurative, formulative, and quantitative approaches when solving mathematical problems. Also, in-class brainstorming is a good place to see different ideas shine. There will be extensive cross-groups sharing of mathematical modeling techniques for basic economic ideas.

Main References:

- Knut Sydsaeter, Peter Hammond, and Arne Strom, *Essential Mathematics for Economic Analysis*, 4th Edition. (required)
(you may use a previous edition - just make sure to match up the relevant chapters).

Recommended Reading:

- Jean Tirole, *Economics for the Common Good*, Princeton Press, 2017. (recommended)

Objectives: This course is primarily designed for undergraduate students to have a snapshot of the relationships between economic theory and basic mathematics, and a decent grasp of the following contents:

- Linear functions: Includes slopes, the general equation for a straight line, slope-intercept form, graphing, linear inequalities, and linear models.
- Quadratic functions and how they can apply to economic models (e.g. a simple monopoly model).

- Polynomials: Includes factoring polynomials, division, and rational functions (these skills are often employed in Econ 3070).
- Exponential and logarithmic functions used extensively in intermediate economics courses (e.g. when presenting positive, monotonic transformations).
- Important function properties and techniques: Includes products and quotients, shifting functions, and composite functions.

Grading Policies:

Midterm 1	20%
Midterm 2	20%
Final Exam	30%
Homework	20%
Attendance	10%

Letter Grade Distribution:

≥ 93.00	A	73.00 - 76.99	C
90.00 - 92.99	A-	70.00 - 72.99	C-
87.00 - 89.99	B+	67.00 - 69.99	D+
83.00 - 86.99	B	63.00 - 66.99	D
80.00 - 82.99	B-	60.00 - 62.99	D-
77.00 - 79.99	C+	≤ 59.99	F

A curve may be applied to the overall course grade to conform to departmental standards. Other than that, I will not grant any request to increase your grade to meet a certain cutoff. You will receive the grade that you earned throughout the course. If you are concerned about your grade(s) you should immediately come talk to me. I will do everything I can to help you be successful in this course.

Course Policies:

• Lectures

Lectures Note-taking is very important in this course. It is highly recommended that you attend lectures, since **I will not post or distribute my class notes**. If you miss some lectures, it is your responsibility to contact a classmate to get the notes corresponding to the missed lecture(s). You are also responsible for any announcement or instructions given in class (this may include instructions for tests). **Notice that lecture recordings will be posted via class emails. Please check them out weekly.**

• Exams

All exams (midterms and final) will take place in class. Please do not be late for any of those.

I will not give any early or make-up exams. In the case that you have to miss any of the midterms

because of a family or medical emergency, and only if you provide documentation to justify that absence, the weight for the corresponding midterm will be added to the final exam. In all other cases, a missed exam will result in a grade of zero for that exam.

The final exam cannot be missed under any circumstances. During all the exams (midterms and final), the use of calculators will NOT be allowed. If I ask for any calculations, these will be easy enough. The only thing you will need for exams will be something to write (pen or pencil). If you have 3 or more finals on the same day, you can arrange to take the last final at an alternate time. **However, you must notify me of this no later than the 10th week into the semester (before Mar 15th) and provide proof that it is your 3rd or more exam on that day.**

Cheating in any of the exams is unacceptable. Any cheating instances will result in a grade of zero and a report to the Honor Code Council.

- **Email**

If you have any questions about the material, send me an email. Sometimes it will be more effective to discuss those questions in office hours. If that is the case, I will ask you to come to my office hours. I will try to respond all emails within 24 hours. If you have any administrative issues covered in the syllabus, please check it before asking me. If after checking the syllabus you still have any questions, come directly to me during office hours. I will not answer administrative questions over the email.

According to FERPA, we are not allowed to discuss grades via email. If you have any questions or concerns about your grade, please come to my office during office hours.

- **Office Hours**

At the top of this syllabus you can find when and where my office hours take place. If you cannot make it at any of those times, send me an email and we can set up an appointment outside those hours.

- **Laptops/electronic devices**

Laptops or other electronic devices are allowed in class.

University Policies:

- **DISABILITY POLICY:** I am committed to providing everyone the support and services needed to participate in this course. If you qualify for accommodations because of a disability, please submit to your instructor a letter from Disability Services in a timely manner so that your needs can be addressed. Disability Services determines accommodations based on documented disabilities. Contact Disability Services at 303-492-8671 or by e-mail at dsinfo@colorado.edu.
- **HONOR CODE:** 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. Incidents of academic misconduct will 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 myself and non-academic sanctions (including but not limited to university probation, suspension, or expulsion).

- **RELIGIOUS OBSERVATION 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 make arrangements with me no later than the first week of the semester.
- **CODE OF 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 has 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 we 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.
- **DISCRIMINATION AND HARASSMENT POLICY:** CU Boulders policy on Discrimination and Harassment can be found on the university website. The policy on Sexual Harassment and 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 discrimination and harassment resources can be obtained at <http://www.colorado.edu/odh>.

Tentative Course Outline:

The weekly coverage might change as it depends on the progress of the class. However, you must keep up with the reading assignments. **Important Dates:**

Week	Date	Content
1	1/10, 1/12, 1/14	Course material: 1.1, 1.2, 1.3
2	1/19, 1/21	Course material: 1.4, 1.5
3	1/24, 1/26, 1/28	Course material: 1.6, 1.7, 2.1
4	1/31, 2/2, 2/4	Course material: 2.2, 2.3, 2.4
5	2/7, 2/9, 2/11	Course material: 2.5, 4.1, 4.2
6	2/14, 2/16, 2/18	Course material: 4.3, 4.4, 4.5
7	2/21, 2/23 , 2/25	Course material: Review, Midterm I , 4.6
8	2/28, 3/2, 3/4	Course material: 4.7, 4.8, 4.9
9	3/7, 3/9, 3/11	Course material: 4.10, 5.1, 5.2
10	3/14, 3/16, 3/18	Course material: 5.3, 5.4, 5.5
11	3/21, 3/23, 3/25	Course material: Spring Break
12	3/28, 3/30, 4/1	Course material: 5.6, 3.1, 3.2
13	4/4, 4/6 , 4/8	Course material: Review, Midterm II , 3.3
14	4/11, 4/13, 4/15	Course material: 3.4, 3.5, 3.6
15	4/18, 4/20, 4/22	Course material: 2.7, 15.1, 15.2
16	4/25, 4/27	Course material: Final Review, Final Review
Final Exam	5/2	Monday, 4 : 30p.m. – 7 : 00p.m.

- *First Day of Class:* Jan 10th
- *Martin Luther King, Jr. Holiday:* Jan 17th, No Class
- *Midterm 1:* Wednesday, Feb 23rd, class time
- *Midterm 2:* Wednesday, Apr 6th, class time
- *Spring Break:* Mar 21st - 25th
- *Final Exam:* Monday, May 2nd, 4:30 - 7:00 PM