ECON 1078-002 Mathematical Tools for Economists 1

University of Colorado Boulder
Department of Economics
Fall 2023

Instructor:	Danielle Parks	Time:	MWF 11:15 AM { 12:05 PM
Email:	Danielle.Parks@colorado.edu	Place:	MUEN E131
O ce:	ECON 401	O ce Hours:	MW 12:15 - 1:15 PM

Course Pages: https://canvas.colorado.edu/

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.

Course Description: This is a one-semester course on mathematical tools that are frequently used by economists. In this course, things will build 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 content above, the course aims to cement a solid foundation for your future economics and business courses.

Main References:

- Knut Sydsaeter, Peter Hammond, and Arne Strom, Essential Mathematics for Economic Analysis, 6th Edition. (required)
  (you may use an alternative edition - just make sure to match up the relevant chapters).

Objectives: This course is primarily designed for students to study the relationship between economic theory and basic mathematics, and to provide an overview of the following content:

- Linear functions: Including slopes, the general equation for a straight line, slope-intercept form, graph-ing, 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: Including products and quotients, shifting functions, and composite functions.

Grading Policies:

Attendance	5%
Participation	10%
Assignments	20%
Midterm 1	15%
Midterm 2	15%
Canvas Quizzes	10%
Final Exam	25%

Letter Grade Distribution:

A	93.00-100
A-	90.00-92.99
B+	87.00-89.99
B	83.00-86.99
B-	80.00-82.99
C+	77.00-79.99
C	73.00-76.99
C-	70.00-72.99
D+	67.00-69.99
D	63.00-66.99
D-	60.00-62.99
F	0.00-59.99

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 cuto . 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:

- General:
  - { Please be respectful and courteous to your classmates as well as myself. You will receive a participation grade. In an e ort to promote the best environment for learning, I ask that you come to class prepared, engage with the material and coursework, and ask questions as needed to facilitate you and your classmates learning.
  - { You are welcome to contact me before/after class, in o ce hours, or via email. Please allow up to 24 hours for an email response during the week and up to 48 hours over the weekend.
  - { Note that if you have questions about your grade, I will likely ask you to look in Canvas or come to o ce hours due to FERPA guidelines.
- Lectures:
  - { I ask that you attend class as that will be the main vehicle for instruction. Class will consist primarily of lectures on course material, followed by problem solving practice.
  - { Please be courteous and refrain from creating distractions during class. This includes silencing and putting away your phone, using any other non-calculator electronic devices only for the purpose of note-taking, and waiting to discuss things outside of the scope of the class until after the lecture.
  - { You will receive an attendance gradefor being present in class. You will be giving up to two unexplained absences that do not hurt your attendance grade. After that, further misses will come out of your attendance grade. If there is some protracted or signi cant unexpected cause for absences, please let me know so that I can consider it in your attendance grade.
  - { I will post the slides on Canvas for reference. We will also do practice problems to guide you through how to apply the topics. It is your responsibility to go over and learn any material that you miss in class - and I cannot promise that everything I say or do in class will appear in the posted slides online. I am always happy to answer your questions about any material.

- Homework:
  - { There will be four graded homework assignments. I will announce the due dates for these in class. You may work in a group, however please be sure to clearly note all group members on your submission.
- Canvas Quizzes:
  - { There will be two proctored Canvas quizzes that will take place during normal class time. I will not give any make-up quizzes. However, your lowest quiz will be dropped. Cheating on any quiz is unacceptable. Any cheating instances will result in a grade of zero and a report to the Honor Code Council.
- Exams:
  - { All exams (midterms and nal) will be in-person. Please do not be late for any of those - no additional time will be given.
  - { I will not give any make-up exams. If you need to take an exam early, please let me know at least two weeksin advance. 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 nal exam. In all other cases, a missed exam will result in a grade of zero for that exam.
  - { The nal exam cannot be missed under any circumstances. During all the exams (midterms and nal), the use of calculators will not be allowed. All calculations will be simple enough to do without one. You will need something to write with (pen or pencil) for your exams. If you have 3 or more nals on the same day, you can arrange to take the last nal at an alternate time. Should an emergency arise, please notify me as soon as possible so that we can make accommodations.

University Policies:

1 University Policies

- Classroom Behavior: Students and faculty are responsible for maintaining an appropriate learning environment in all instructional settings, whether in person, remote, or online. Failure to adhere to such behavioral standards may be subject to discipline. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, political a liation, or political philosophy.

  For more information, see the classroom behavior policy, the Student Code of Conduct, and the O ce of Institutional Equity and Compliance.
- Requirements for Infectious Diseases Members of the CU Boulder community and visitors to campus must follow university, department, and building health and safety requirements and all public health orders to reduce the risk of spreading infectious diseases.

  The CU Boulder campus is currently mask optional. However, if masks are again required in classrooms, students who fail to adhere to masking requirements will be asked to leave class. Students who do not leave class when asked or who refuse to comply with these requirements will be referred to Student Conduct & Con ict Resolution. Students who require accommodation because a disability

prevents them from ful lling safety measures related to infectious disease will be asked to follow the steps in the \Accommodation for Disabilities" statement on this syllabus.

For those who feel ill and think you might have COVID-19 or if you have tested positive for COVID-19, please stay home and follow the further guidance of the Public Health O ce. For those who have been in close contact with someone who has COVID-19 but do not have any symptoms and have not tested positive for COVID-19, you do not need to stay home.

- Accommodation for Disabilities, Temporary Medical Conditions, and Medical Isolation: Disability Services determines accommodations based on documented disabilities in the academic environment. If you qualify for accommodations because of a disability, submit your accommodation letter from Disability Services to your faculty member in a timely manner so your needs can be addressed. Contact Disability Services at 303-492-8671 or dsinfo@colorado.edu for further assistance.

  If you have a temporary medical condition or required medical isolation for which you require accommodation, see Temporary Medical Conditions on the Disability Services website.

- Preferred Student Names and Pronouns: CU Boulder recognizes that students' legal information doesn't always align with how they identify. Students may update their preferred names and pronouns via the student portal; those preferred names and pronouns are listed on instructors' class rosters. In the absence of such updates, the name that appears on the class roster is the student's legal name.

- Honor Code: All students enrolled in a University of Colorado Boulder course are responsible for knowing and adhering to the Honor Code. Violations of the Honor Code may include but are not limited to: plagiarism (including use of paper writing services or technology [such as essay bots]), cheating, fabrication, lying, bribery, threat, unauthorized access to academic materials, clicker fraud, submitting the same or similar work in more than one course without permission from all course instructors involved, and aiding academic dishonesty. All incidents of academic misconduct will be reported to Student Conduct & Con ict Resolution: honor@colorado.edu, 303-492-5550. Students

Tentative Course Outline: (Note that the weekly coverage might change depending on our progress.)

Week	Date	Content
1	Aug 28-Sep 1	Syllabus, 1.1, 1.2
2	Sep 4-8	No class Sep. 4, 2.1, 2.2
3	Sep 11-15	2.3, 2.4, Quiz 1 (1.1 - 2.4)
4	Sep 18-22	2.5, 2.6, 2.7
5	Sep 25-29	2.9, 2.10, 2.12,Homework 1 due (1.1 - 2.12)
6	Oct 2-6	Review, Midterm 1 (1.1 - 2.12)
7	Oct 9-13	3.1, 3.2, 3.3
8	Oct 16-20	3.4, 3.6, Homework 2 due (3.1 - 3.6)
9	Oct 23-27	Quiz 2 (3.1 - 3.6) , 4.1, 4.2, 4.3
10	Oct 30-Nov 3	4.4, 4.5, 4.6
11	Nov 6-10	4.7, 4.8, 4.9,Homework 3 due (4.1 - 4.8)
12	Nov 13-17	4.10, Review,Midterm 2 (3.1 - 4.10)
13	Nov 20-24	Fall Break, No Class
14	Nov 27-Dec 1	5.1, 5.2, 5.3
15	Dec 4-8	5.4, 5.5
16	Dec 11-15	Homework 4 due (5.1 - 5.5) , Final Review, No class on Friday, Dec 15
Final Exam	Dec 17	Sunday, 1:30 p.m. - 4:00 p.m.

Important Dates:

- First Day of Class: Aug 28th
- Labor Day: Sept 4th, No Class
- Quiz 1: Friday, Sep 15th
- Midterm 1: Friday, Oct 6th
- Quiz 2: Monday, Oct 23rd
- Midterm 2: Friday, Nov 17th

- Fall Break/Thanksgiving: Nov 21st - Nov 25th
- Last Day of Class: Wednesday, Dec 13th
- Final Exam: Sunday, Dec 17, 1:30 - 4:00 PM