

# ECON 1078-002 MATHEMATICAL TOOLS FOR ECONOMISTS 1

University of Colorado Boulder  
Department of Economics  
Fall 2022

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<b>Office:</b>	ECON 304	<b>Office Hours:</b>	Th 2 - 3 PM, F 10 - 11 AM

**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, 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: Including products and quotients, shifting functions, and composite functions.

## Grading Policies:

Homework .....	30%
Midterm 1 .....	20%
Midterm 2 .....	20%
Final Exam .....	30%

**Letter Grade Distribution:**

$\geq 93.00$	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+	$\leq 59.99$	F

**Course Policies:**

- **Lectures:** Attendance is very important in this course, and it is highly recommended that you attend lectures. The material and examples covered in class will directly prepare you for homework and exams.
- **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.
- **Exams:** All exams (midterms and final) will be in-person.

**Midterms:** I will not give any early or make-up exams. In the case that you have to miss a midterm due to a family or medical emergency, you must provide documentation to justify that absence before the scheduled exam time, and the weight for that 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.

**Final exam:** The final exam is cumulative. If you have 3 or more finals on the same day, you can arrange to take the last exam(s) at an alternate time. **However, you must notify me of this no later than the 10th week of the semester (by Oct 28<sup>th</sup>) and provide proof that it is your 3rd or more exam on that day.**

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

- **Email:** In addition to office hours, please always feel free to reach out via email. I will try to respond to all emails by the end of the following business day. According to FERPA, I am not allowed to discuss grades via email. If you have any questions or concerns about your grade, please come see me during office hours.

**University Policies:**

# 1 University Policies

- **Classroom Behavior:** Both students and faculty are responsible for maintaining an appropriate learning environment in all instructional settings, whether in person, remote or online. Those who fail 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 affiliation or political philosophy. For more information, see the [classroom behavior policy](#), the [Student Code of Conduct](#), and the [Office of Institutional Equity and Compliance](#).
- **Requirements for COVID-19** As a matter of public health and safety, all members of the CU Boulder community and all visitors to campus must follow university, department and building requirements and all public health orders in place to reduce the risk of spreading infectious disease. CU Boulder currently requires COVID-19 vaccination and boosters for all faculty, staff and students. Students, faculty and staff must upload proof of vaccination and boosters or file for an exemption based on medical, ethical or moral grounds through the MyCUHealth portal.

The CU Boulder campus is currently mask-optional. However, if public health conditions change and masks are again required in classrooms, students who fail to adhere to masking requirements will be asked to leave class, and students who do not leave class when asked or who refuse to comply with these requirements will be referred to Student Conduct and Conflict Resolution. For more information, see the policy on classroom behavior and the Student Code of Conduct. If you require accommodation because a disability prevents you from fulfilling these safety measures, please follow the steps in the “Accommodation for Disabilities” statement on this syllabus.

If you feel ill and think you might have COVID-19, if you have tested positive for COVID-19, or if you are unvaccinated or partially vaccinated and have been in close contact with someone who has COVID-19, you should stay home and follow the further guidance of the Public Health Office ([contacttracing@colorado.edu](mailto:contacttracing@colorado.edu)). If you are fully vaccinated and have been in close contact with someone who has COVID-19, you do not need to stay home; rather, you should self-monitor for symptoms and follow the further guidance of the Public Health Office ([contacttracing@colorado.edu](mailto:contacttracing@colorado.edu)).

- **Accommodation for Disabilities:** If you qualify for accommodations because of a disability, please submit your accommodation letter from Disability Services to your faculty member in a timely manner so that your needs can be addressed. Disability Services determines accommodations based on documented disabilities in the academic environment. Information on requesting accommodations is located on the [Disability Services website](#). Contact Disability Services at 303-492-8671 or [dsinfo@colorado.edu](mailto:dsinfo@colorado.edu) for further assistance. If you have a temporary medical condition, 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, 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 & Conflict Resolution ([honor@colorado.edu](mailto:honor@colorado.edu)); 303-492-5550). Students found responsible for violating the [Honor Code](#) will be assigned resolution outcomes from the Student Conduct & Conflict Resolution as well as be subject to academic sanctions from the

faculty member. Additional information regarding the Honor Code academic integrity policy can be found on the [Honor Code website](#).

- **Sexual Misconduct, Discrimination, Harassment and/or Related Retaliation:** CU Boulder is committed to fostering an inclusive and welcoming learning, working, and living environment. University policy prohibits sexual misconduct (harassment, exploitation, and assault), intimate partner violence (dating or domestic violence), stalking, protected-class discrimination and harassment, and related retaliation by or against members of our community on- and off-campus. These behaviors harm individuals and our community. The Office of Institutional Equity and Compliance (OIEC) addresses these policies, and individuals who believe they have been subjected to misconduct can contact OIEC at 303-492-2127 or email [cureport@colorado.edu](mailto:cureport@colorado.edu). Information about university policies, [reporting options](#), and support resources can be found on the [OIEC website](#). Please know that faculty and graduate instructors have a responsibility to inform OIEC when they are made aware of any issues related to these policies regardless of when or where they occurred to ensure that individuals impacted receive information about their rights, support resources, and resolution options. To learn more about reporting and support options for a variety of concerns, visit [Don't Ignore It](#).
- **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 you have a conflict, please make arrangements with me no later than the first week of the semester.

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

Week	Date	Content
<b>1</b>	Aug 22-26	Syllabus, 1.1, 1.2
<b>2</b>	Aug 29-Sep 2	2.1, 2.2, 2.3
<b>3</b>	Sep 7-9	No class Sep. 5, 2.4, 2.5
<b>4</b>	Sep 12-16	2.6, 2.7, 2.8
<b>5</b>	Sep 19-23	2.9, 2.10, 2.11
<b>6</b>	Sep 26-30	2.12, Review, <b>Midterm 1 (1.1 - 2.12)</b>
<b>7</b>	Oct 3-7	3.1, 3.2, 3.3
<b>8</b>	Oct 10-14	3.4, 3.5, 3.6
<b>9</b>	Oct 17-21	4.1, 4.2, 4.3
<b>10</b>	Oct 24-28	4.4, 4.5, 4.6
<b>11</b>	Oct 31-Nov 4	4.7, 4.8, 4.9
<b>12</b>	Nov 7-11	4.10, Review, <b>Midterm 2 (3.1 - 4.10)</b>
<b>13</b>	Nov 14-18	5.1, 5.2, 5.3
<b>14</b>	Nov 21-25	<b>Fall Break, No Class</b>
<b>15</b>	Nov 28-Dec 2	5.4, 5.5, 5.6
<b>16</b>	Dec 5-7	Final Review, No class on Friday, Dec 9
<b>Final Exam</b>	<b>Dec 11</b>	<b>Sunday, 1:30 p.m. - 4:00 p.m.</b>

**Important Dates:**

- *First Day of Class:* Aug 22<sup>nd</sup>
- *Labor Day:* Sept 5<sup>th</sup>, No Class
- *Midterm 1:* Friday, Sept 30<sup>th</sup>
- *Midterm 2:* Friday, Nov 11<sup>th</sup>
- *Fall Break/Thanksgiving:* Nov 21<sup>st</sup> - Nov 25<sup>th</sup>
- *Last Day of Class:* Wednesday, Dec 7<sup>th</sup>
- *Final Exam:* Sunday, Dec 11, 1:30 - 4:00 PM