



University of Colorado Boulder
MATH TOOLS FOR ECONOMISTS 1
ECON 1078 SYLLABUS, FALL 2026

Instructor: Dr. Sara Avila

Email: sara.avila@colorado.edu

Zoom: <https://cuboulder.zoom.us/my/saraavila>

- Office Hours: Tuesdays and Thursdays 9 am -11:00 am using Zoom

INSTRUCTOR BIO

I am an economics instructor with more than two decades of experience. My research interests are in the fields of environmental economics and more recently, in how to teach economics. I have worked on topics related to air quality, climate change, urban transportation, and biodiversity conservation. I am passionate about building understanding in a diverse environment. I am also an avid (but aging) runner, so when I am not injured, I run every day.

Term Start: August 31, 2026.

Term End: October 9, 2026, with final exam ending on October 11, 2026.

COURSE WEBSITE

Canvas is our class website:

- Login using your University of Colorado Boulder identikey and password
<https://canvas.colorado.edu/>
- Under Course List, click "ECON 1078: Math Tools for Economists"
- Note: all email correspondence will be through your CU Boulder email address.
 - Do not use the Canvas email or messages, it is not checked.

COURSE DESCRIPTION

From General Catalog: Teaches mathematical skills and logical thinking for use in economics. Topics include algebra, graphs, functions, and probability. Includes many "Real world" examples and some illustrative computer assignments.

This course is the first of a two-course sequence (ECON 1078 and ECON 1088), designed to introduce a variety of mathematical concepts which will be used extensively in future economics coursework. Math will help you understand and describe the way firms and consumers optimize decisions subject to constraints. It will also provide the building blocks you will use in your statistics and econometrics courses, which will enable you to apply economics concepts to real-world data. This course is fundamentally a combined algebra review and a pre-calculus course. Topics include logic, algebra, number theory, set theory, graphs, functions, and more.

COURSE PREREQUISITES

None

COURSE DESCRIPTION

By the end of the course you should be able to:

- Complete exercises corresponding to basic college algebra including exercises related to real numbers, integer powers, basic algebraic identities and expressions, factoring, fractions, rational exponents, inequalities, intervals and absolute values.
- Solve equations including how to solve simple linear equations (with parameters), systems of two linear equations, quadratic equations, and other non-linear equations.
- Recall the rules of set theory and an introduction to logic including necessary and sufficient conditions.
- Summation notation and working with summations.
- Complete exercises related to functions, including exercises on the following topics:
 - definition of a function, notation, domain and range, and graphs of functions
 - 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
 - polynomials: includes factoring polynomials, division, and rational
 - exponential and logarithmic functions
 - important function properties and techniques: includes products and quotients, shifting functions, and composite functions

REQUIRED COURSE MATERIALS

Course Website: <https://canvas.colorado.edu/> (Canvas) Grades and any further additional readings will be posted on Canvas. Please check Canvas frequently for any relevant notifications/changes that may occur throughout the course.

Calculator: You need a scientific calculator that has log and ln (among other) functions. Although Dr. Gebhardt uses a TI-84 in the instructional videos, most any scientific calculator will be ok.

Textbook (required): College Mathematics for Business, Economics, Life Sciences, and Social Sciences, 14th edition WITH MYLAB MATH. Published by Pearson, Copyright 2019. By Barnett, Ziegler, Byleen, and Stocker.

You need MyLab Math access for a minimum of 8 weeks. If you are also taking ECON 1088 online through Continuing Education, you will use the same text. Therefore, to save money, purchase access to MyLab Math for the entirety of both courses. Prices for single-term access to MyLab Math is close to \$97 ([purchased through Pearson MyLab](#)). You can also purchase access through the CU Bookstore.

CU Book Access: <https://www.cubookstore.com/bookaccess>

If you are taking in person courses and your other courses require expensive texts, you might want to consider [CU Book Access which costs: \\$269 + tax](#). **This may not be the best option for you if you take courses online or you only take a few courses.**

Supplemental Readings: Supplemental readings and other materials will be provided in Canvas system, via the CU Library electronic reserve, or by links to websites.

ONLINE COURSE STRUCTURE

This course is delivered via distance education format using the CU Canvas system. The asynchronous format will use a combination of readings, online discussion, and other web-based resources. Asynchronous learning does not require real-time (or synchronous) interaction; instead, content is available online for you to access when it best suits your schedule, and assignments are completed prior to the deadlines listed in the schedule. You will interact with the instructor and other students using the communication functions provided by Canvas. You will submit assignments using Canvas, email, or through another online system.

COURSE SCHEDULE

Review the separate weekly class schedule found on Canvas under “Syllabus” link.

CLASS PARTICIPATION

This course is designed to engage you mostly through exercises, however, there will also be required professor check-ins to ensure you are as successful as possible.

EVALUATION AND GRADING

Course grades will be determined by the completion of assignments, exams, and discussions, as shown below:

Assignment*	Points per Assignment	Frequency	Number of assignments dropped	GRADE POINTS	GRADE PERCENTAGE
Syllabus Quiz	10	1	0	10	1%
MyLab Quiz	5	1	0	5	0.5%
Proctoring Verification Quiz	5	1	0	5	0.5%
Topic Homework + Final Exam Prep	20	26	3	460	46%
Proctored Weekly Topics Quiz	50	5	1	200	20%
Professor Check-in	30	2	0	60	6%
Proctored Cumulative Final Exam	260	1	0	260	26%
Total				1000	100%

* Keep a copy of all work created for the course, including work submitted through Canvas.

COURSE GRADING CRITERIA

Grade	Percentage Grade	Equivalent Points	Indicates
A	94.1-100	941 – 1000	Excellent

A-	90-94	900 – 940	
B+	87-89.99	870 – 899	
B	83-86.99	830 – 869	Above Average
B-	80-82.99	800 – 829	
C+	77-79.99	770 – 799	
C	73-77.99	730 – 769	Average
C-	70-72.99	700 – 729	
D+	67-69.99	670 – 699	
D	63-67.99	630 – 669	Below Average
D-	60-62.99	600 – 629	
F	0-59	600 or lower	Failure

ASSIGNMENTS

Syllabus, MyLab, and Proctoring Verification Quizzes (20 POINTS) – These quizzes are to ensure that you are proficient in MyLab, understand the rules and procedures of the course, and are able to use the proctoring tool correctly.

Topic Homeworks or Preparation for Cumulative Final Exam (460 POINTS) – There will be twenty-four (24) 20-point homeworks corresponding to each of the 24 topics in the course and two (2) 20-point assignments to prepare for the cumulative final exam. The format of these homeworks will be multiple choice, calculations, and short answers and will be open book and open notes. Your lowest three (3) of these assignments are dropped from your final grade calculation. These homeworks are designed to check your level of understanding for each topics and help you prepare for the weekly topics quiz. You have one attempt at the homework. These homeworks will be submitted through Canvas or MyLab.

Proctored Weekly Topics Quiz (200 POINTS) – There will be five (5) 50-point quizzes corresponding to the first 5 weeks of the course. The format of quizzes will be multiple choice, calculations, and short answers and will be closed-book and closed-note. Your lowest one (1) quiz is dropped from your final grade calculation. These quizzes are designed to check your level of understanding for the week's topics and help you prepare for the cumulative final exam. You have one attempt at the quiz. Quizzes will be submitted through Canvas or MyLab. The quizzes are completed on Canvas or MyLab in a proctored setting.

Professor Check-in (60 POINTS) – You will meet with your professor a minimum of 2 times during the term to have a brief discussion about the course, coursework, and progress. The goal of these check-ins is to make sure that you are as successful as possible. The accelerated nature of this course means that

it is essential that any issues or challenges are identified early to ensure success. We will meet on Zoom at a time that works with both of our schedules Monday – Saturday.

- Check-in schedule: during week 1, and during week 6 prior to the final exam.

Proctored Cumulative Final Exam (260 POINTS) – There will be one final exam. The proctored cumulative final exam is worth 260 points. The format of the exam will be multiple choice and calculations and will be closed book and closed note. The exam is completed on Canvas or MyLab in a proctored setting.

This course requires proctored quizzes and examinations. Proctoring requires planning on your part. Proctors are individuals who administer the exam process following the guidelines provided by University of Colorado Boulder to ensure academic integrity.

Who can be my proctor?

If you are in Boulder or nearby, you can take your exam:

1. **With me** at the Department of Economics. There is no cost for using this proctor. This option is only on selected days during the quiz or exam period.
2. With **Proctorio or a comparable online proctoring service as determined by your instructor**. Online proctoring is a service that uses a webcam and microphone to ensure academic integrity. To use this service, you must have access to a computer with a webcam and a microphone. There is no cost for using this proctor.

If you outside of Boulder, you can take your exam:

1. At an **accredited college or university testing center** in your town or nearby. There may be a cost for using this testing center.
2. With **Proctorio or a comparable online proctoring service as determined by your instructor**. Online proctoring is a service that uses a webcam and microphone to ensure academic integrity. To use this service, you must have access to a computer with a webcam and a microphone. There is no cost for using this proctor.

Please see Canvas for detailed information about proctoring, Proctorio, and a nationwide list of accredited college or university testing centers. If you are in a rural area or on a military base, you may need to be approved to use a person as a proctor and information is provided on Canvas for this approval process.

EXTRA CREDIT

Up to 30 points of extra **may be** available (= maximum 3% of the course grade).

- Up to 30 points extra may be available during the semester for completing certain activities, such as listening and commenting on a podcast, completing special activities, etc. These extra credit opportunities will be determined by the instructor and announced in on Canvas.

POLICY ON DUE DATES

Each module you will complete a series of critical thinking questions that reflect material from the various delivery formats and required readings. It is your responsibility to turn in each assignment on

the required date. **Late assignments are not accepted for exams or professor check-ins. Topic homeworks and topic quizzes can be turned in up to two days late. The grade penalty is 10%.** The exceptions that may be considered is due to sickness, university excused function, or circumstances beyond the students' control. The instructor reserves the sole right to determine what grounds constitutes a reasonable excuse for missing or submitting a late work assignment and the right to require the student to submit proper verification of such excuse.

COMMUNICATION

I am nice and I want you to succeed. Do not hesitate to contact me about anything.

E-mail: sara.avila@colorado.edu

- **Please always remind me of what course you are taking.** Since I teach several courses, I forget what course you are taking, especially at the beginning of the semester.
- I will respond to email within 12-18 hours, but usually within 2-4 hours. I always respond to emails. If you have not had a response within 18 hours, I did not receive the email. Be sure to use your CU email address because sometimes Gmail and yahoo email accounts are filtered into my spam folder.

Additional ways to contact Dr. Avila:

- Online Office Hours: Wednesdays and Thursdays 10 am -11:30 am using Zoom (<https://cuboulder.zoom.us/my/saraavila>)

General Course Announcements

- Announcements: Please check the "announcements" section on Canvas.

COURSE POLICIES

NETIQUETTE

All students should be aware that their behavior impacts other people, even online. I expect that we will all strive to develop a positive and supportive environment and will be courteous to fellow students and your instructor.

TECHNOLOGY SUPPORT

What are the basic computer specifications for Canvas?

- Visit the official [Canvas Computer Specifications Page](#) for the latest list of recommended system requirements.

Which browsers does Canvas support?

- Visit the [Supported Browsers Page](#) for the detailed list of internet browsers in Windows, MacOS, iOS and Android.

Skill Requirements

- Students also need to possess basic computer skills, such as:
 - How to use a web browser and word processor
 - How to send and receive email
 - How to locate a file and attach it to an email or upload a file into a course
 - How to copy and paste

- Must know basic typing skills and keyboard commands
- Must know basic computer terminology

TECHNICAL SUPPORT

- Canvas technical support. If you are experiencing issues with Canvas please contact:
 - CU Boulder's Help desk at 303-735-4357 (5-HELP) or help@colorado.edu. 5-Help will answer your call: Monday through Friday from 7:30 a.m. to 7:00 p.m., Saturday and Sunday from noon to 6:00 p.m., Closed during [University Holidays](#)
 - On your computer, click the “help” (?) icon on the left side of Canvas, once logged in
 - Within the Canvas App, you can search the Canvas support guides, Report a Problem or chat with Canvas Support 24 hours a day, 7 days a week.
- MyLab tech support:
 - https://help.pearsoncmg.com/ccng/ccng_instr/ccng_xmel_instr_help_support_bridge.html or <https://support.pearson.com/getsupport/s/>

ACCOMODATION FOR DISABILITIES

[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, please contact me through email, text, or phone call as soon as possible. Also see [Temporary Medical Conditions](#) on the Disability Services website. If you have a temporary illness, injury or required medical isolation for which you require adjustment, contact the professor immediately to request accommodation.

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, marital 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](#)

HONOR CODE

"On my honor, as a University of Colorado Boulder student
I have neither given nor received unauthorized assistance."

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. Understanding the course's syllabus is a vital part in adhering to the Honor Code.

All incidents of academic misconduct will be reported to Student Conduct & Conflict Resolution: StudentConduct@colorado.edu. 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. Visit [Honor Code](#) for more information on the academic integrity policy.

SEXUAL MISCONDUCT, DISCRIMINATION, HARRASSMENT AND/OR RELATED RETALIATION

CU Boulder is committed to fostering an inclusive and welcoming learning, working, and living environment. University policy prohibits [protected-class](#) discrimination and harassment, sexual misconduct (harassment, exploitation, and assault), intimate partner abuse (dating or domestic violence), stalking, and related retaliation by or against members of our community on- and off-campus. The Office of Institutional Equity and Compliance (OIEC) addresses these concerns, and individuals who have been subjected to misconduct can contact OIEC at 303-492-2127 or email cureport@colorado.edu. Information about university policies, [reporting options](#), and [support resources](#) including confidential services can be found on the [OIEC website](#).

Please know that faculty and graduate instructors must inform OIEC when they are made aware of incidents related to these policies regardless of when or where something occurred. This is to ensure that individuals impacted receive outreach from OIEC about resolution options and support resources. To learn more about reporting and support for a variety of concerns, visit the [Don't Ignore It page](#).

RELIGIOUS HOLIDAYS

Campus policy regarding religious observances requires that faculty make every effort to deal reasonably and fairly with all students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. See the [campus policy regarding religious observances](#) for full details. Because of the flexibility of timing of completion of assignments in this class, you must contact the instructor in at least two weeks in advance if you anticipate a religious holiday may impact your completion of coursework.

For more information on the religious holidays most commonly observed by CU Boulder students consult the [online interfaith calendar](#).

STUDENT 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.

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 the classroom. Since our course is online we do not face this risk, except in the case of in-person proctoring. Students who refuse to comply with these requirements will be referred to Student Conduct & Conflict Resolution. Students who require accommodation because a disability prevents them from fulfilling 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 Office](#). 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.

COURSE WITHDRAWAL POLICY

Any student who wishes to withdraw from the course must do so by the date in the following link: <https://ce.colorado.edu/resources/topics/dates-and-deadlines-general-info/>

ACCOMMODATION FOR DISABILITIES, TEMPORARY MEDICAL CONDITIONS, AND MEDICAL ISOLATION

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 for further assistance. If you have a temporary medical condition, see [Temporary Medical Conditions](#) on the Disability Services website.

MENTAL HEALTH AND WELLNESS

The University of Colorado Boulder is committed to the well-being of all students. If you are struggling with personal stressors, mental health or substance use concerns that are impacting academic or daily life, please contact [Counseling and Psychiatric Services \(CAPS\)](#) located in C4C or call (303) 492-2277, 24/7.

Free and unlimited telehealth is also available through [Academic Live Care](#). The Academic Live Care site also provides information about additional wellness services on campus that are available to students.

ADDITIONAL SUPPORT SERVICES

A variety of instructional support services, such as writing center, guidance on personal or educational issues, tutoring questions and library resources are available to the students. For more information about their services, visit their websites linked under modules on Canvas.



Math Tools for Economists 1, ECON 1078, Fall 2026 with Avila

WEEK (start date)	TO PIC	Chapter Number & Name	Graded Assignments	Due Date by 11:59pm MST/MDT
PRE CLASS		Pre-class preparation	Pre-class assignment MyLab Quiz How to use Proctoring Quiz Schedule Professor Check in	Monday 8/31 Monday 8/31 Monday 8/31 Monday 8/31
WEEK 1 (9/1)	1	A.1 Real Numbers	Topic 1 Homework	Tuesday 9/1
	2	A.2 Operations on Polynomials	Topic 2 Homework	Wednesday 9/2
	3	A.3 Factoring Polynomials	Topic 3 Homework	Thursday 9/3
	4	A.4 Operations in Rational Expressions	Topic 4 Homework Proctored Quiz Topics 1-4	Friday 9/4 Sunday 9/6
WEEK 2 (9/8)	5	A.5 Integer Exponents and Scientific Notation	Topic 5 Homework	Tuesday 9/8
	6	A.6 Rational Exponents and Radicals	Topic 6 Homework	Wednesday 9/9
	7	A.7 Quadratic Equations	Topic 7 Homework	Thursday 9/10
	8	1.1 Linear Equations and Inequalities	Topic 8 Homework Proctored Quiz Topics 5-8	Friday 9/11 Sunday 9/13
WEEK 3 (9/14)	9	1.2 Graphs and Lines	Topic 9 Homework	Monday 9/14
	10	2.1 Functions	Topic 10 Homework	Tuesday 9/15
	11	2.2 Elementary Functions	Topic 11 Homework	Wednesday 9/16
	12	2.3 Quadratic Functions	Topic 12 Homework	Thursday 9/17
	13	2.4 Polynomial and Rational Functions	Topic 13 Homework Proctored Quiz Topics 9-13	Friday 9/18 Sunday 9/20
WEEK 4 (9/21)	14	2.5 Exponential Functions	Topic 14 Homework	Monday 9/21
	15	2.6 Logarithmic Functions	Topic 15 Homework	Tuesday 9/22
	16	4.1 Systems of linear equations 2 variables	Topic 16 Homework	Wednesday 9/23
	17	System of Linear equations-Supply and Demand	Topic 17 Homework	Thursday 9/24
	18	7.1 Logic	Topic 18 Homework Proctored Quiz Topics 14-18	Friday 9/25 Sunday 9/27
WEEK 5 (9/28)	19	7.2 Sets	Topic 19 Homework Schedule Professor Check-in	Monday 9/28
	20	7.3 Basic Counting Principles	Topic 20 Homework	Tuesday 9/29
	21	7.4 Permutations and Combinations	Topic 21 Homework	Wednesday 9/30
	22	B.1 Sequences, Series and Summation Notation	Topic 22 Homework	Thursday 10/1
	23	8.1 Sample Spaces, Events and Probability	Topic 23 Homework Proctored Quiz Topics 19-23	Friday 10/2 Sunday 10/4
WEEK 6 (10/5)	24	8.2 & 8.3 Union, Intersection and Complement of events, odds conditional probability, intersection and independence	Topic 24 Homework	Monday 10/5
			Final Exam Prep 1 Final Exam Prep 2	Wednesday 10/7 Thursday 10/8
FINAL (10/9)		You may take the proctored Final Exam the day of your choosing Friday through Sunday	Proctored Final Exam	Friday 10/9- Sunday 10/11