University of Colorado Boulder

MATH TOOLS FOR ECONOMISTS 1

ECON 1078 SYLLABUS, FALL 2023

INSTRUCTOR: DR. KAREN GEBHARDT

Email karen.gebhardt@colorado.edu

Mobile

- This is my cell phone number. Call or text anytime between 9am – 8pm MTN. I sometimes have my phone turned off during the middle of the day, but leave a message when it is a good time to get a hold of you and I will call you back.

Office/Tutoring Hours

- Tutoring Hours: Mondays 3-5 pm using Zoom and by appointment

On-Campus Office Location: 203 Economics (link to map)

INSTRUCTOR BIO

Dr. Karen Gebhardt is the Director for Undergraduate Online Learning with the Office of Academic and Learning Innovation and the Director of the Online Economics Program with the Department of Economics and Division of Continuing Education at CU Boulder. Her research focuses on using learning analytics to improve student learning outcomes in economics education with an emphasis on improving grades and completion rates in online courses. She is an early adopter of technology in the classroom and advocates strongly for it because she sees the difference it makes in student engagement and learning. In her free time, Dr. Gebhardt enjoys rock climbing and traveling in the Colorado Rockies and beyond.

TERM START: September 5, 2023

TERM END: October 20, 2023

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 1078-581: Math Tools for Economists 1"
- 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 Objectives

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.

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 (August 2023) for 18-week access to MyLab Math is $79.99 (purchased through Pearson MyLab). You can also purchase access through the CU Bookstore. 14-day free temporary access is available.

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 OUTLINE

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 class discussions on the topics covered in the course materials. It is important that you participate in class discussions to facilitate learning by other students and gain exposure to different viewpoints of other students in the class.

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	20	26	5	420	42%
Proctored Weekly Topics Quiz	50	6	1	250	25%
Professor Check-in	20	3	0	60	6%
Proctored Cumulative Final Exam	250	1	0	250	25%
Total				1000	100%

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

COURSE GRADING CRITERIA, *THERE IS +/– GRADING IN THIS CLASS.*

Grade	***Percentage Grade***	***Equivalent Points***	***Indicates***
A	*93-100*	*930 – 1000*	*Excellent*
A-	*90-92.99*	*900 – 929*	
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 (420 POINTS) – There will be twenty-six (26) 20-point homeworks corresponding to each of the 26 topics in the course. The format of these homeworks will be multiple choice, calculations, and short answers and will be open book and open notes. Your lowest five (5) of these homeworks 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 (250 POINTS) – There will be six (6) 50-point quizzes corresponding to the first 6 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 3 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 either on Zoom or in-person at a time that works with both of our schedules Monday – Sunday 9am -9pm.

- Check-in schedule: during week 1, during weeks 3-4, and during weeks 6-7 prior to the final exam.

Proctored Cumulative Final Exam (250 POINTS) – There will be one final exam. The proctored cumulative final exam is worth 250 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.

Expectations of Instructor

I take my role as your instructors very seriously, and, in fact, I care about how well you do in this course and that you have a satisfying, rewarding experience. To that end, it is our commitment to you to respond individually to the work you submit in this class and to return your work in a timely manner. If, however, due to unforeseeable circumstances, the grading of your work takes longer than the times I have listed here, I will keep you informed of my progress and make every effort to return your work with feedback as soon as I can.

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

E-mail

Instructor Karen Gebhardt karen.gebhardt@colorado.edu

- All e-mail sent to me should contain the following: Course Name and Number (i.e., "ECON 1078" or "Math"), Your Name, Short Description of your question. I will respond to email within 12-24 hours, but usually within 4-6 hours. I always respond to email if the email necessitates a response. If you have not had a response within 36 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.

Mobile

- This is my cell phone number. Call or text anytime between 9am – 8pm MTN. I sometimes have my phone turned off during the middle of the day, but leave a message when it is a good time to get a hold of you and I will call you back.

Office/Tutoring Hours

- Tutoring Hours: Mondays 3-5 pm using Zoom

General Course Announcements

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

COURSE POLICIES

NETIQUETTE

All students should be aware that their behavior impacts other people, even online. I hope that we will all strive to develop a positive and supportive environment and will be courteous to fellow students and your instructor. Due to the nature of the online environment, there are some things to remember.

1. Always think before you write. In other words, without the use of nonverbals with your message, your message can be misinterpreted. So please think twice before you hit submit.
2. Keep it relevant. There are places to chat and post for fun everyday stuff. Do not stray from the discussion in the assigned questions.
3. Never use all caps. This is the equivalent of yelling in the online world. It is not fun to read. Only use capital letters when appropriate.
4. Make sure that you are using appropriate grammar and structure. In other words, I don't want to see anyone writing "R U" instead of "are you". There are people in the class that may not understand this type of abbreviation, not to mention it does nothing to help expand your writing and vocabulary skills. Emoticons are fine as long as they are appropriate. A smile 😊 is welcome, anything offensive is not.
5. Treat people the same as you would face-to-face. In other words, it is easy to hide behind the computer. In some cases, it empowers people to treat others in ways they would not in person. Remember there is a person behind the name on your screen. Treat all with dignity and respect and you can expect that in return.
6. Respect the time of others. This class is going to require you to work in groups. Learn to respect the time of others in your group and your experience will be much better. Always remember that you are not the only person with a busy schedule, be flexible. Do not procrastinate! You may be one that works best with the pressures of the deadline looming on you, but others may not be that way. The same is true for the reverse. The key to a successful group is organization, communication and a willingness to do what it takes to get it done.

Website: http://www.albion.com/netiquette/corerules.html
Compiled by Melissa Landin, Instructor, Dept. of Communication, Inver Hills Community College, mlandin@inverhills.edu

TECHNOLOGY REQUIREMENTS AND 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/

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, please contact me through email, text, or phone call as soon as possible. Also see Temporary Medical Conditions on the Disability Services website.

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 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, 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); 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 protected-class discrimination and harassment, sexual misconduct (harassment, exploitation, and assault), intimate partner violence (dating or domestic violence), stalking, 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 concerns, and individuals who believe they 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 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 incidents related to these policies regardless of when or where something occurred. This is to ensure that individuals impacted receive an outreach from OIEC about their options for addressing a concern and the support resources available. To learn more about reporting and support resources for a variety of issues, visit Don't Ignore It.

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. Because of the flexibility of timing of completion of assignments in this class, you must contact the instructor in at least one week 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.

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.

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 & 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.

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.

Course Withdrawal Policy

Any student who wishes to withdraw from the course must do so by October 4. For complete information, please visit https://ce.colorado.edu/resources/topics/dates-and-deadlines-online-credit/

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.

ECON 1078 Section 581 MATH TOOLS FOR ECONOMISTS 1, Fall 2023 with Gebhardt

Day	Date	Topic #	Topic	Textbook Section	Graded Assignments
Week 1					
Monday	4-Sep		No Class, University Holiday		
Tuesday	5-Sep	1	Real Numbers	A.1	Syllabus Quiz MyLab Quiz Topic Homework
Wednesday	6-Sep	2	Operations on Polynomials	A.2	Topic Homework Proctoring Quiz
Thursday	7-Sep	3	Factoring Polynomials	A.3	Topic Homework
Friday	8-Sep	4	Operations in Rational Expressions	A.4	Topic Homework

Week 2					
Monday	11-Sep				Proctored Weekly Topics 1-4 Quiz
Tuesday	12-Sep	5	Integer Exponents and Scientific Notation	A.5	Topic Homework
Wednesday	13-Sep	6	Rational Exponents and Radicals	A.6	Topic Homework
Thursday	14-Sep	7	Quadratic Equations	A.7	Topic Homework
Friday	15-Sep	8	It's all Greek to me!		Topic Homework
Week 3					
Monday	18-Sep				Proctored Weekly Topics 5-8 Quiz
Tuesday	19-Sep	9	Linear Equations and Inequalities	1.1	Topic Homework
Wednesday	20-Sep	10	Graphs and Lines	1.2	Topic Homework
Thursday	21-Sep	11	Functions	2.1	Topic Homework
Friday	22-Sep	12	Elementary Functions: Graphs and Transformations	2.2	Topic Homework
Week 4					
Monday	25-Sep				Proctored Weekly Topics 9-12 Quiz
Tuesday	26-Sep	13	Quadratic Functions	2.3	Topic Homework
Wednesday	27-Sep	14	Polynomial and Rational Functions	2.4	Topic Homework
Thursday	28-Sep	15	Exponential Functions	2.5	Topic Homework
Friday	29-Sep	16	Logarithmic Functions	2.6	Topic Homework
Week 5					
Monday	2-Oct				Proctored Weekly Topics 13-16 Quiz
Tuesday	3-Oct	17	Review: Systems of Linear Equations in Two Variables	4.1	Topic Homework
Wednesday	4-Oct	18	System of Linear Equations, Supply and Demand Applications		Topic Homework
Thursday	5-Oct	19	Logic	7.1	Topic Homework
Friday	6-Oct	20	Sets	7.2	Topic Homework
Week 6					
Monday	9-Oct				Proctored Weekly Topics 17-20 Quiz
Tuesday	10-Oct	21	Basic Counting Principles	7.3	Topic Homework
Wednesday	11-Oct	22	Permutations and Combinations	7.4	Topic Homework

Thursday	12-Oct	23	Sequences, Series, and Summation Notation	B.1	Topic Homework
Friday	13-Oct	24	Sample Spaces, Events, and Probability	8.1	Topic Homework
Week 7					
Monday	16-Oct				Proctored Weekly Topics 21-24 Quiz
Tuesday	17-Oct	25	Union, Intersection, and Complement of Events; Odds	8.2	Topic Homework
Wednesday	18-Oct	26	Conditional Probability, Intersection, and Independence	8.3	Topic Homework
Thursday	19-Oct		Review		Practice Final Exam 1 (Extra Credit)
Friday	20-Oct		Review		Practice Final Exam 2 (Extra Credit)
Sunday	22-Oct		Cumulative Final Exam		Proctored Cumulative Final Exam