

University of Colorado - Boulder
Fall 2022
Syllabus ECON1088 - Math Tools for Economists II

Instructor: Dr. Shawn Swanson
Office: ECON 14b
Office Hours: MWF 11:00 – 12:00

Email: shawn.swanson@colorado.edu
Zoom: <https://cuboulder.zoom.us/my/ask.shawn>

| Section | Class Time | Room | Final |
|----------|-------------------------|----------|-------------------------------------|
| 1088-001 | MWF 10:10 AM - 11:00 AM | ECON 117 | Sunday, Dec. 11, 7:30 PM -10:00 PM |
| 1088-002 | MWF 12:20 PM - 01:10 PM | ECON 117 | Saturday, Dec. 10, 4:30 PM -7:00 PM |

Description

This class is the second of a two-course sequence. It is a continuation of ECON 1078 and builds upon the algebraic foundation developed in that course. We will cover important mathematical tools used in economics and their applications. These tools include derivatives, optimization, and integrals. They will be used extensively in your subsequent economics courses.

Prerequisites

Requires prerequisite course of ECON 1078 or MATH 1011 or MATH 1071 or MATH 1150 or MATH 1160 (minimum grade C-) or an ALEKS math exam taken in 2016 or earlier, or placement into pre-calculus based on your admission data and/or CU Boulder coursework. College level algebra skills are necessary for success in this course.

Required Textbook

Required Textbook: Knut Sydsaeter, Peter Hammond, Arne Strom and Andres Carvajal, *Essential Mathematics for Economic Analysis*, Pearson, 4th ed., 2016

This textbook will serve as an excellent resource for you future Economics classes.

Attendance

Class attendance is necessary for success in this course and therefore mandatory. To give students an external commitment device, attendance will be taken indirectly through the use of unannounced quizzes and clicker questions. If you will have an extended absence, please notify me as soon as possible. *If you anticipate an excused absence, please notify me in advance of missing any classes, assignments, or exams.*

Canvas

I use Canvas extensively to keep this course organized and make announcements. Additionally, the problems sets and solutions will be available on Canvas as well. Grades will be posted on Canvas as soon as they are available.

Office Hours

Office hours are the best way to get extra help if needed. I would be happy to schedule a time outside of office hours if a scheduling conflict prevents you from coming during the assigned hours. I'm happy to meet in-person or via Zoom.

Cheating

Don't do it. You will get caught, fail the course, and be reported to the Honor Code Council.

Electronic Device Policy

Please silence electronic devices during lectures. You are welcome to use electronic devices for note taking and accessing learning materials online. However, do not use electronic devices during class time for non-class activities (i.e. social media, etc), or you will be asked to turn it off and put it away.

Communication Policy

Email will be my primary form of communication with the class:

- I will use your CU email address for class communications, so check your CU mailbox frequently.
- I will answer you as soon as possible. Please allow 24 hours for a response.
- Please refer to the syllabus to answer questions, before contacting me.
- Questions on course material are often more easily and thoroughly answered in person. Please use my office hours as your primary means of obtaining help with course material.
- Under no circumstances can I provide grades through email due to Family Educational Rights and Privacy Act (FERPA) regulations, since emails are not considered secure. Grades will be available on Canvas.

Grading

It is important to note, there will be no makeup work or makeup exams in this class. In fairness to everyone, there are no exceptions to this rule. Note that late assignments will not be accepted, instead I will drop your lowest two homework assignments, lowest quiz, and lowest five clicker scores. Your total grade in this course will be determined as follows:

| | |
|-----------------------|----------------|
| • Problem sets | 15% |
| • Unannounced Quizzes | 10% |
| • Clickers | 10% |
| • Midterms | 45% (15% Each) |
| • Final | 20% |
| • Extra Credit | Up to 3% |

Problem Sets:

There will be 11 problem sets. Many of these problems will be solved in during class. It is strongly suggested you attempt additional problems. Problem sets will be graded on completion. Feel free to work in groups, but you must turn in your own work. Unsubstantiated or illegible answers will receive partial credit at most. Late work will not be accepted. At 5 p.m. on the due date, detailed solutions will be released on Canvas.

Exams:

There are 3 midterm exams, and while they are not explicitly cumulative, material does naturally build upon itself. The final exam will be *cumulative* and must be held per university policy. The University's final exam policy can be found [here](#). Unsubstantiated or illegible answers will receive partial credit at most. Exams will be closed book, closed notes. Only basic scientific calculators will be permitted, no computers, cell phone, or graphing calculators. All exams will take place in the regular classroom unless otherwise noted. There will be no makeup exams. If you miss an exam and have appropriate documentation (e.g., illness, bereavement, university sanctioned event) your other coursework will be appropriately reweighted, otherwise you will receive a zero for the exam.

iClickers:

We will be using iClicker to enhance active learning and participation in this course. Unfortunately, the space we are in has insufficient wifi for the entire class to reliably use iClicker mobile polling on your personal devices. Therefore, you will need to obtain an iClicker + remote for use in class. You may be able to check one out from the Norlin circulation desk for the semester, on a first-come, first-served basis. You will also need to have an iClicker student app account, and register your clicker there. You will not be able to use the iClicker student app to vote in class. Student resources for iClicker can be found [here](#). You will receive 1 point for answering a question and an additional point for answering correctly.

Unannounced in-class quizzes:

There will be 6-8 unannounced quizzes during the semester. You will be allowed to work in small groups of 2-4 students.

Extra credit:

There will be extra credit assignments found on Canvas that correspond to each problem set. The extra credit grade will be calculated by adding 3% times your extra credit percentage score to your overall grade. Since it is added to your final grade, any extra credit can only increase your grade. All extra credit will close Dec 8th.

Letter Grades:

Grades may be curved at the instructor's discretion. Your (curved) final course grade will automatically be increased up to 0.5% to meet any grade cutoff. No further grade adjustments are available. Letter grades will be assigned as follows:

| Percentage | Grade | Percentage | Grade |
|------------|-------|------------|-------|
| 94-100 | A | 73-76 | C |
| 90-93 | A- | 70-72 | C- |
| 87-89 | B+ | 67-69 | D+ |
| 83-86 | B | 63-66 | D |
| 80-82 | B- | 60-62 | D- |
| 77-79 | C+ | 0-59 | F |

Course Resources and Recipe for Success

Because the class is inherently cumulative, it is essential to invest time early. This will make the rest of the semester much more manageable.

Let me be clear, I want you to be successful in this course. I will do whatever I can to help you learn. Therefore, there are numerous resources for you to succeed.

Office Hours: This is an excellent opportunity to get additional clarification and get one-on-one instruction. I love working with students during office hours. It is among the most rewarding things I get to do as an instructor, so please take advantage. If a scheduling conflict prevents you from attending my office hours, I will be happy to schedule a time with you. In addition to my office hours, your TA will also hold office hours.

Econ Tutoring Lab: The Economics department provides a free tutoring lab. Information can be found on the department's website: <https://www.colorado.edu/economics/undergraduate-program>

Private Tutors: Private tutors are available for a fee. Information can be found on the department's website: <https://www.colorado.edu/economics/undergraduate-program>

There is a strong correlation between attendance and homework with a student's overall grade. The correlation coefficients are greater than 0.60. I would be remiss if I did not note that correlation does not imply causation. Nonetheless, imitating the approach of successful students is not a bad strategy. Take this course seriously. Use the available resources. Keep up with the course and do not fall behind.

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). 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).

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 for further assistance. If you have a temporary medical condition, see [Temporary Medical Conditions](#) on the Disability Services website. *You must provide me with your disability letter and contact me to make suitable arrangements at least two weeks prior to any exam.*

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); 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. 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 deal reasonably and fairly with all students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. In this class, *please notify me in advance of missing any classes, assignments, or exams.*

See the [campus policy regarding religious observances](#) for full details.

Tentative Course Schedule

| Week | Topics | Due |
|---------------------------|---|-------------|
| Week 1 (Aug 22 - Aug 26) | <ul style="list-style-type: none"> Administration Section 6.1 - Slopes of Curves Section 6.2 - Tangents and Derivatives Section 6.5 - A Dash of Limits | Pretest due |
| Week 2 (Aug 29 - Sep 2) | <ul style="list-style-type: none"> Section 6.2 - Tangents and Derivatives (cont.) Section 6.6 - Simple Rule for Differentiation Section 6.3 - Increasing and Decreasing Functions | PS1 |
| Week 3 (Sep 5 - Sep 9) | <ul style="list-style-type: none"> Labor Day (No class 9/5) Section 6.4 - Rates of Change Section 6.7 - Sums, Products, and Quotients | PS2 |
| Week 4 (Sep 12- Sep 16) | <ul style="list-style-type: none"> Section 6.8 - Chain Rule Section 6.9 - Higher-Order Derivatives Section 6.10 - Exponential Functions | PS3 |
| Week 5 (Sep 19 - Sep 23) | <ul style="list-style-type: none"> Section 6.11 - Logarithmic Functions Section 7.1 - Implicit Differentiation Section 7.2 - Economic Examples | PS4 |
| Week 6 (Sep 26 - Sep 30) | <ul style="list-style-type: none"> Chapter 6 Review Midterm 1 on Chapter 6 (9/28) Section 7.7 – Elasticities | |
| Week 7 (Oct 3 - Oct 7) | <ul style="list-style-type: none"> Section 7.8 – Continuity Section 8.1 - Optimization Introduction Section 8.2 - Simple Tests for Extreme Points | PS5 |
| Week 8 (Oct 10- Oct 14) | <ul style="list-style-type: none"> Section 8.3 - Economic Examples Section 8.6 - Local Extreme Points Section 8.7 - Inflection Points | PS6 |
| Week 9 (Oct 17- Oct 21) | <ul style="list-style-type: none"> Section 11.1 - Functions of Two Variables Section 11.5 - Functions of More Variables Section 11.2 - Partial Derivatives with Two Variables Section 11.3 - Geometric Representation | PS7 |
| Week 10 (Oct 24 - Oct 28) | <ul style="list-style-type: none"> Chapters 7 and 8 Review Midterm 2 on Chapters 7 and 8 (10/26) Section 11.6 - Partial Derivatives with More Variables | |
| Week 11 (Oct 31 - Nov 4) | <ul style="list-style-type: none"> Section 11.7 - Economic Applications Section 11.8 - Partial Elasticities Section 14.1 - The Lagrange Multiplier Method | PS8 |
| Week 12 (Nov 7 - Nov 11) | <ul style="list-style-type: none"> Section 14.1 - The Lagrange Multiplier Method Section 9.1 - Indefinite Integrals Section 9.2 - Area and Definite Integrals | PS9 |
| Week 13 (Nov 14 - Nov 18) | <ul style="list-style-type: none"> Chapters 11 and 14 Review Midterm 3 on Chapters 11 and 14 (11/16) Section 9.3 - Properties of Definite Integrals | |
| Week 14 (Nov 21 - Nov 25) | <ul style="list-style-type: none"> Fall Break (No classes 11/21 – 11/25) | |
| Week 15 (Nov 28 - Dec 2) | <ul style="list-style-type: none"> Section 9.4 - Economic Applications Section 9.5 - Integration by Parts Semester review | PS10 |
| Week 16 (Dec 5 - Dec 9) | <ul style="list-style-type: none"> Semester review Reading Day (No class 12/9) | PS11* |

All assignments are due at the start of class Friday unless otherwise announced.

****Note, week 16 assignments are due Thursday due to reading day.***