

**University of Colorado - Boulder**  
**Fall 2020**  
**Syllabus ECON1078 - Math Tools for Economists 1**

Instructor: Shawn Swanson

Class Meetings: Lectures are prerecorded and available on Canvas, in-person attendance is NOT required

Office Hours: MW 11:30 am – 12:20 pm in GOLD A2B07 and synchronously online using zoom

Zoom: <https://cuboulder.zoom.us/my/ask.shawn>

Email: [shawn.swanson@colorado.edu](mailto:shawn.swanson@colorado.edu)

**Course Description:**

Economics as practiced today is a form of applied mathematics that uses many different mathematical tools to develop models to understand the world around us. This course teaches fundamental mathematical skills and logical thinking that serves as a basis for economic thought. Topics include logic, algebra, number theory, set theory, graphs, functions, and more. We will explore these topics using "real world" examples. This class will be vital in preparing you for the more advanced calculus techniques found in ECON 1088.

This will be a hybrid class, where in-person attendance is optional. All lectures will be prerecorded and posted to Canvas for your convenience. The recorded lectures are a useful tool, which will allow you to slowdown, fast forward, and pause lectures to increase comprehension. Office hours will be held in-person and synchronously via zoom.

**Prerequisites:**

There are no prerequisites for this course, though a solid understanding of high school math will serve you well. This class is the first of a two class sequence (ECON 1078 and ECON 1088).

**Required Textbook:**

*Essential Mathematics for Economic Analysis. 4th Ed.*  
by Knut Sydsaeter, Peter Hammond, and Arne Strom

This textbook is also used in ECON 1088 and serves as an excellent reference.

**Technology Requirements:**

An electronic device that can access the internet and has audio and video capture is required. This will be necessary to access recorded lectures, problem sets, exams, and other content on Canvas, as well as conduct Zoom meetings and upload completed work. Access to a printer is also needed, in order to print exams and problem sets downloaded from Canvas.

**Grading:**

There will be no makeup work or makeup exams in this class, except under extraordinary circumstances. I drop 2 problem sets and 1 midterm, which is intended to accommodate whatever life events might impact your studies, excused or otherwise. Your total grade in this course will be determined as follows:

• Participation	10%
• Problem sets	20%
• Midterms	35%
• Final	35%

*Participation:*

Participation will take several forms to accommodate these extraordinary circumstances. Recorded lectures will be available online, so that lectures are available when you are. I expect that students progress through each week's material during the week indicated on this syllabus. Please notify me any week that you will be unable to do so. I will monitor your level of engagement through your use of course resources on Canvas and in-person participation (if applicable). *In-person attendance is not required.*

**Zoom:**

Zoom will be used to conduct office hours as well as proctor online exams. Please comport yourself for Zoom interaction as you would for in-person instruction, e.g. wear clothing. My Zoom contact information is noted at the top of the syllabus.

**Problem Sets:**

There will be 12 problem sets. Many of these problems will be solved in lecture. It is strongly suggested you attempt additional problems. Problem sets will be graded on effort and 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. Students will upload their solutions to Canvas by 5:00 p.m. the day they are due. At 5:30 p.m., detailed solutions will be released on Canvas, and no further work will be accepted and you will receive a zero for the assignment. Note your two lowest problem set scores will be dropped.

**Exams:**

Exams will be held online during class time due to limited classroom space, and will be proctored via zoom. Just prior to the exam period, students will sign into Zoom using video in order to be proctored. Students will download and print exams from Canvas, and then scan and upload once complete. Exams will be closed book, closed notes. Only basic scientific calculators will be permitted, no computers, cell phone, or graphing calculators.

There are 2 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 at <http://www.colorado.edu/policies/final-examination-policy>. Unsubstantiated or illegible answers will receive partial credit at most. There will be no makeup exams. Note your lowest midterm will be dropped. If you miss the final and have appropriate documentation your other coursework will be appropriately reweighted, otherwise you will receive a zero for the exam.

**Letter Grades:**

Letter grades will be assigned as follows and scores may be curved at the instructor's discretion:

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

**Exam Dates (tentative)**

Midterm I	Friday	10/09/2020	Online, during class time
Midterm II	Wednesday	11/25/2020	Online, during class time
Final Exam	Sunday	12/13/2020	Online, 1:30-4:00pm

All exams will take place online and will be proctored via zoom, unless otherwise noted.

**Canvas**

Lecture notes and recordings can be found on the home page of this course in Canvas. Problems sets and solutions will be posted in the corresponding assignments section. All grades will be posted on Canvas as soon as they are available.

## Office Hours

Office hours are available for students who want in-person instruction, or those who want additional help. They will be held in-person in our assigned classroom and synchronously using zoom. Note our classroom can only accommodate 9 students, due to COVID-19 restrictions. A signup sheet for each week's in-person office hours will be released on Canvas every Sunday at 8 a.m. If nobody signs up by 5 p.m. the night before the office hours (e.g. by 5 p.m. Tuesday night for Wednesday office hours) those office hours will only be held synchronously using zoom. No signup is required to join office hours via zoom.

## Calculators:

Only basic scientific calculators are permitted on exams, no computers, cell phone, or graphing calculators. You are encouraged to use graphing calculators and software to study in order to deepen your understanding.

## Requirements for COVID-19

As a matter of public health and safety due to the pandemic, all members of the CU Boulder community and all visitors to campus must follow university, department and building requirements, and public health orders in place to reduce the risk of spreading infectious disease. Required safety measures at CU Boulder relevant to the classroom setting include:

- maintain 6-foot distancing when possible,
- wear a cloth face covering (over nose and mouth), especially when unable to maintain a distance of at least 12 feet,
- clean local work area,
- practice hand hygiene,
- follow public health orders, and
- if sick and
  - you live off campus, do not come onto campus (unless instructed by a CU Healthcare professional), or
  - you live on-campus, please alert CU Boulder Medical Services.

Students who fail to adhere to these 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 policies on COVID-19 Health and Safety and classroom behavior and the Student Code of Conduct. If you require accommodation because a disability prevents you from fulfilling these safety measures, please see the "Accommodation for Disabilities" statement on this syllabus.

Before returning to campus, all students must complete the COVID-19 Student Health and Expectations Course. Before coming on to campus each day, all students are required to complete a Daily Health Form.

Students who have tested positive for COVID-19, have symptoms of COVID-19, or have had close contact with someone who has tested positive for or had symptoms of COVID19 must stay home and complete the Health Questionnaire and Illness Reporting Form remotely. In this class, if you are sick or quarantined, please alert me as soon as possible so that I'm aware of your situation and can accommodate you as best as possible.

## 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 D2L.

## **Electronic Device Policy**

Please silence electronic devices during exams as well as any synchronous or in-person learning. 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 (e.g. social media, etc), or you will be asked to turn it off and put it away.

## **Disability Accommodations**

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 or injury, see Temporary Medical Conditions under the Students tab on the Disability Services website and discuss your needs with your professor.

## **Classroom Behavior Policy**

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 policies on classroom behavior and the Student Code of Conduct.

## **Religious Observance Policy**

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. If you have a conflict, please contact me at the beginning of the term so we can make proper arrangements.

## **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 policy may include: 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 the Honor Code (honor@colorado.edu); 303-492-5550). Students found responsible for violating the academic integrity policy will be subject to nonacademic sanctions from the Honor Code as well as academic sanctions from the faculty member. Additional information regarding the Honor Code academic integrity policy can be found at the Honor Code Office website.

## **Discrimination & Harassment Policy**

The University of Colorado Boulder (CU Boulder) is committed to fostering an inclusive and welcoming learning, working, and living environment. CU Boulder will not tolerate acts of sexual misconduct (harassment, exploitation, and assault), intimate partner violence (dating or domestic violence), stalking, or protected-class discrimination or harassment by members of our community. Individuals who believe they have been subject to misconduct or retaliatory actions for reporting a concern should contact the Office of Institutional Equity and Compliance (OIEC) at 303-492-2127 or cureport@colorado.edu. Information about the OIEC, university policies, anonymous reporting, and the campus resources can be found on the OIEC website.

Please know that faculty and instructors have a responsibility to inform OIEC when made aware of incidents of sexual misconduct, dating and domestic violence, stalking, discrimination, harassment and/or related retaliation, to ensure that individuals impacted receive information about options for reporting and support resources.

### Course Schedule:

Week	Content
Week 1 (8/24, 8/26, 8/28)	<ul style="list-style-type: none"> <li>• Material: 1.1, 1.2, 1.3</li> <li>• Topics: Numbers, Integer powers, Rules of algebra</li> <li>• Assignments Due: Week 1 assignment 8/28</li> </ul>
Week 2 (8/31, 9/2, 9/4)	<ul style="list-style-type: none"> <li>• Material: 1.4, 1.5, 1.6</li> <li>• Topics: Fractions, Fractional powers, Inequalities</li> <li>• Assignments Due: PS1 9/4</li> </ul>
Week 3 (9/7, 9/9, 9/11)	<ul style="list-style-type: none"> <li>• <b>Labor Day (9/7) - No Classes</b></li> <li>• Material: 1.7, 2.1</li> <li>• Topics: Intervals and absolute value, Simple equations</li> <li>• Assignments Due: PS2 9/11</li> </ul>
Week 4 (9/14, 9/16, 9/18)	<ul style="list-style-type: none"> <li>• Material: 2.2, 2.3, 2.4</li> <li>• Topics: Equations with parameters, Quadratic equations, Linear equations in two unknowns</li> <li>• Assignments Due: PS3 9/18</li> </ul>
Week 5 (9/21, 9/23, 9/25)	<ul style="list-style-type: none"> <li>• Material: 2.5, 3.4, 3.6</li> <li>• Topics: Nonlinear equations, Logic, Set theory</li> <li>• Assignments Due: PS4 9/25</li> </ul>
Week 6 (9/28, 9/30, 10/2)	<ul style="list-style-type: none"> <li>• Material: 3.6, 4.1, 4.2</li> <li>• Topics: Set theory (cont), Functions</li> <li>• Assignments Due: PS5 10/2</li> </ul>
Week 7 (10/5, 10/7, 10/9)	<ul style="list-style-type: none"> <li>• Material: 4.3, Review, <b>MT1 (Friday 10/9)</b></li> <li>• Topics: Graphing</li> <li>• Assignments Due: PS6 10/9</li> </ul>
Week 8 (10/12, 10/14, 10/16)	<ul style="list-style-type: none"> <li>• Material: 4.4, 4.5, 4.6</li> <li>• Topics: Linear functions, Quadratic functions</li> <li>• Assignments Due: None</li> </ul>
Week 9 (10/19, 10/21, 10/23)	<ul style="list-style-type: none"> <li>• Material: 4.7, 4.8, 4.9</li> <li>• Topics: Polynomials, Power functions, Exponential functions</li> <li>• Assignments Due: PS7 10/23</li> </ul>
Week 10 (10/26, 10/28, 10/30)	<ul style="list-style-type: none"> <li>• Material: 4.10, 5.1, 5.2</li> <li>• Topics: Logarithmic functions, Shifting graphs, New functions from old</li> <li>• Assignments Due: PS8 10/30</li> </ul>
Week 11 (11/2, 11/4, 11/6)	<ul style="list-style-type: none"> <li>• Material: 5.3, 5.4, 5.5,</li> <li>• Topics: Inverse functions, Graphing equations, Distance in the plane</li> <li>• Assignments Due: PS9 11/6</li> </ul>
Week 12 (11/9, 11/11, 11/13)	<ul style="list-style-type: none"> <li>• Material: 5.6, 3.1, 3.2</li> <li>• Topics: General functions, Summation notation, Rules of sums</li> <li>• Assignments Due: PS10 11/13</li> </ul>
Week 13 (11/16, 11/18, 11/20)	<ul style="list-style-type: none"> <li>• Material: 3.3, 6.1, 6.2, 6.3</li> <li>• Topics: Double sums, Slope of curves, Tangents and derivatives, Increasing and decreasing functions</li> <li>• Assignments Due: PS11 11/20</li> </ul>
Week 14 (11/23, 11/25, 11/27)	<ul style="list-style-type: none"> <li>• Material: Review, <b>MT2 (Wednesday 11/25)</b></li> <li>• Topics: None</li> <li>• Assignments Due: PS12 11/27</li> <li>• <b>Fall Break (11/27) - No Class</b></li> </ul>
Week 15 (11/30, 12/2, 12/4)	<ul style="list-style-type: none"> <li>• Transition to full online (No in-person class)</li> <li>• Review sessions</li> </ul>
Week 16 (12/6)	<ul style="list-style-type: none"> <li>• Office hours. No new material.</li> </ul>