

**University of Colorado - Boulder**  
**Fall 2018**  
**Syllabus ECON1078 - Math Tools for Economists 1**

Instructor: Shawn Swanson  
Class Meetings: MWF 11:00 am – 11:50 am in MUEN E131  
Office: ECON 14  
Office Hours: MF 10:00 – 10:50 or by appointment  
Email: shawn.swanson@colorado.edu

**Course Description:**

Economics as practiced today is a form of applied mathematics and uses many different mathematical skills to develop models to understand the world around us. This course teaches fundamental mathematical skills and logical thinking that will serve 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 prepare you for more advanced calculus techniques found in ECON 1088.

**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 course sequence (ECON 1078 and ECON 1088).

**Required Textbook:**

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

Purchase of this text is required. It serves as an excellent reference, and will be used in ECON 1088 as well.

**Grading:**

Your total grade in this course will be determined as follows:

- |                            |     |
|----------------------------|-----|
| • Problem Sets             | 15% |
| • Group Work/Participation | 15% |
| • Midterm 1                | 20% |
| • Midterm 2                | 20% |
| • Final                    | 30% |

*Problem Sets:*

There will be 12 problem sets. They will be issued on Mondays and due the following Monday before class. These will be graded primarily on completion, with full credit given if a reasonable attempt is made for each problem. Feel free to work in groups, but you must turn in your own work. You must show all work! Unsubstantiated or illegible answers will receive partial credit at most. Late work submitted prior to 5p.m on the date due will receive half credit at most; after 5 p.m. no late work will be accepted under any circumstances and you will receive a zero score for the assignment. Note your two lowest problem set scores will be dropped.

*Group Work/Participation:*

We will be using clickers, available from the university bookstore. One point will be given for submitting an answer to each clicker question, with an additional point awarded to correct answers.

There will be a 5-6 unannounced in class group exercises throughout the semester. You will work on these in small groups of 3-4 students. You must show all work! Unsubstantiated or illegible answers will receive partial credit at most. These exercises will be closed book, closed notes. No make-up work will be accepted under any circumstances. Note your lowest group work exercise will be dropped.

### *Midterm Exams:*

There are 2 midterm exams, and while they are not explicitly cumulative, material does naturally build upon itself. 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. There will be no makeup exams. If you miss a midterm for any reason your final will become 50% of your grade.

### *Final Exam:*

The final exam will be *cumulative* and must be held per university policy. If you require accommodation for the final exam, it is your responsibility to inform me in a timely manner pursuant to the University's final exam policy, which can be found at <http://www.colorado.edu/policies/final-examination-policy>. 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.

### *Letter Grades:*

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

<b>Percentage</b>	<b>Grade</b>	<b>Percentage</b>	<b>Grade</b>
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	2/22/19	During class time
Midterm II	Friday	4/5/19	During class time
Final Exam	Sunday	5/5/19	1:30pm – 4:00pm

All exams will take place in the regular classroom unless otherwise noted.

### **D2L**

Problems sets will be released on D2L, Mondays at 8a.m. Solutions to group exercises and problems sets will be posted on D2L. Grades will be posted to D2L 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.

### **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.

### **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 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.

### **Disability Accommodations**

If you qualify for accommodations because of a disability, please submit a letter from Disability Services in a timely manner so that your needs may be addressed. Disability Services determines accommodations based on documented disabilities. Contact: 303-492-8671, Willard 322, and <http://www.colorado.edu/disabilityservices>

### **Classroom Behavior Policy**

Students and faculty each have responsibility for maintaining an appropriate learning environment. Students who fail to adhere to such behavioral standards may be subject to discipline. Faculty has the professional responsibility to treat all students with understanding, dignity and respect, to guide classroom discussion and to set reasonable limits on the manner in which they and their students express opinions.

Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with differences of race, culture, religion, politics, sexual orientation, gender variance, and nationalities. Class rosters are provided to the instructor with the student's legal name. I will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me of this preference early in the semester so that I may make appropriate changes to my records. See policies at <http://www.colorado.edu/policies/classbehavior.html> and at [http://www.colorado.edu/studentaffairs/judicialaffairs/code.html#student\\_cod](http://www.colorado.edu/studentaffairs/judicialaffairs/code.html#student_cod)

### **Religious Observance Policy**

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 contact me at the beginning of the term so we can make proper arrangements.

### **Honor Code**

All students of the University of Colorado at Boulder are responsible for knowing and adhering to the academic integrity policy of this institution. Violations of this policy may include: cheating, plagiarism, aid of academic dishonesty, fabrication, lying, bribery, and threatening behavior. All incidents of academic misconduct shall be reported to the Honor Code Council ([honor@colorado.edu](mailto:honor@colorado.edu); 303-725-2273).

Students who are found to be in violation of the academic integrity policy will be subject to both academic sanctions from the faculty member and non-academic sanctions (including but not limited to university probation, suspension, or expulsion). Other information on the Honor Code can be found at <http://www.colorado.edu/policies/honor.html> and at <http://www.colorado.edu/academics/honorcode/>

### **Discrimination & Harassment Policy**

The University of Colorado Policy on Sexual Harassment applies to all students, staff and faculty. Sexual harassment is unwelcome sexual attention. It can involve intimidation, threats, coercion, or promises or create an environment that is hostile or offensive. Harassment may occur between members of the same or opposite gender and between any combinations of members in the campus community: students, faculty, staff, and administrators. Harassment can occur anywhere on campus, including the classroom, the workplace, or a residence hall. Any student, staff or faculty member who believes s/he has been sexually harassed should contact the Office of Discrimination and Harassment (ODH) at 303-492-2127 or the Office of Judicial Affairs at 303-492-5550. Information about the ODH and the campus resources available to assist individuals who believe they have been sexually harassed can be obtained at: <http://www.colorado.edu/odh/>

**Course Schedule:**

Week	Content
Week 1 (1/14, 1/16, 1/18)	<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: PS1 Available 1/14</li></ul>
Week 2 (1/23, 1/25)	<ul style="list-style-type: none"><li>• Material: 1.4, 1.5</li><li>• Topics: Fractions, Fractional powers</li><li>• Assignments: PS2 Available 1/23; PS1 Due 1/23</li></ul>
Week 3 (1/28, 1/30, 2/1)	<ul style="list-style-type: none"><li>• Material: 1.6, 1.7, 2.1</li><li>• Topics: Inequalities, Intervals and absolute value, Simple equations</li><li>• Assignments: PS3 Available 1/28; PS2 Due 1/28</li></ul>
Week 4 (2/4, 2/6, 2/8)	<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: PS4 Available 2/4; PS3 Due 2/4</li></ul>
Week 5 (2/11, 2/13, 2/15)	<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: PS5 Available 2/11; PS4 Due 2/11</li></ul>
Week 6 (2/18, 2/20, 2/22)	<ul style="list-style-type: none"><li>• Material: 3.6, Review, Exam 1 (Friday 2/22)</li><li>• Topics: Set theory (cont)</li><li>• Assignments: PS5 Due 2/18</li></ul>
Week 7 (2/25, 2/27, 3/1)	<ul style="list-style-type: none"><li>• Material: 4.1, 4.2, 4.3</li><li>• Topics: Functions, Graphing</li><li>• Assignments: PS6 Available 2/25</li></ul>
Week 8 (3/4, 3/6, 3/8)	<ul style="list-style-type: none"><li>• Material: 4.4, 4.5, 4.6</li><li>• Topics: Linear functions, Quadratic functions</li><li>• Assignments: PS7 Available 3/4; PS6 Due 3/4</li></ul>
Week 9 (3/11, 3/13, 3/15)	<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: PS8 Available 3/11; PS7 Due 3/11</li></ul>
Week 10 (3/18, 3/20, 3/22)	<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: PS9 Available 3/18; PS8 Due 3/18</li></ul>
Week 11 (3/25, 3/27, 3/29)	Spring Break - Woot! Woot!
Week 12 (4/1, 4/3, 4/5)	<ul style="list-style-type: none"><li>• Material: Review, 5.3, Exam 2 (Friday 4/5)</li><li>• Topics: Inverse functions</li><li>• Assignments: PS9 Due 4/1</li></ul>
Week 13 (4/8, 4/10, 4/12)	<ul style="list-style-type: none"><li>• Material: 5.4, 5.5, 5.6</li><li>• Topics: Graphing equations, Distance in the plane, General functions</li><li>• Assignments: PS10 Available 4/8</li></ul>
Week 14 (4/15, 4/17, 4/19)	<ul style="list-style-type: none"><li>• Material: 3.1, 3.2, 3.3</li><li>• Topics: Summation notation, Rules of sums, Double sums</li><li>• Assignments: PS11 Available 4/15; PS10 Due 4/15</li></ul>
Week 15 (4/22, 4/24, 4/26)	<ul style="list-style-type: none"><li>• Material: 3.7, 15.1, 15.2</li><li>• Topics: Induction, Systems of linear equations, Matrices and matrix operations</li><li>• Assignments: PS12 Available 4/22; PS11 Due 4/22</li></ul>
Week 16 (4/29, 5/2)	<ul style="list-style-type: none"><li>• Review for final exam</li><li>• Assignments: PS12 Due 4/29</li></ul>