

ECON 1078-004

Math Tools for Economists 1

MWF 1:00 pm - 1:50 pm in ECON 119

Teacher: Akhil Rao

Email: [akhil.rao@colorado.edu](mailto:akhil.rao@colorado.edu)

Class website: D2L

Office location: ECON 414

Office Hours: T 10:30-11:30am, W 11am-noon, and by appointment

This syllabus will guide our class, but it is not set in stone. I will update it throughout the semester to ensure that it reflects our goals and progress.

We shall not cease from exploration  
And the end of all our exploring  
Will be to arrive where we started  
And know the place for the first time.

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3. Quadratic functions and how they can apply to economic models (e.g. a simple monopoly model, a simple least-squares problem).

{ I will create 8 take-home problem sets. You may use your lecture notes, your textbook, and your computer to work out these problems. Each problem set will be graded on out of 5 or 10 points, with the majority of the points being based on effort. **Submit these on D2L \*\*AS A SINGLE FILE\*\* before class starts or they will be considered late.**

{ I will assign readings throughout the semester. You will be responsible for turning in typed summaries of the readings on D2L. The summaries must be at least half a page, and may be up to 1 page. They will be graded either 0 or 1: 0 if incomplete, 1 if complete. The summaries should cover the content of the readings, but also a little of what you thought of them. These summaries are so that I know you have done the readings, not to assess your writing; **don't overthink it. Submit these on D2L.**

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## Office hours

- { I encourage you to come to my office hours to discuss any of the material from lecture. Please bring notes and specific questions.
- { If the posted office hours don't work for you, email me and we will set up an appointment.

I reserve the right to modify the policies listed above.

## Grading Framework:

Clicker questions	10%
Assignments	30%
Midterm exam 1	15%
Midterm exam 2	15%
Final Exam	30%

## Letter Grade Distribution:

$\geq 94.00$	A	73.00 - 76.99	C
90.00 - 93.99	A-	70.00 - 72.99	C-
87.00 - 89.99	B+	67.00 - 69.99	D+
83.00 - 86.99	B	63.00 - 66.99	D
80.00 - 82.99	B-	60.00 - 62.99	D-
77.00 - 79.99	C+	$\leq 59.99$	F

## Additional information:

**Disability Accommodations:** If you qualify for accommodations because of a disability, please submit to me a letter from Disability Services in a timely manner so that your needs be addressed. Disability Services determines accommodations based on documented disabilities. Contact: 303-492-8671, Center for Community N200, and

<http://www.Colorado.EDU/disabilityservices>

. If you have a temporary medical condition or injury, see guidelines at

<http://www.colorado.edu/disabilityservices/go.cgi?select=temporary.html>.

Disability Services' letters for students with disabilities indicate legally mandated reasonable accommodations. The syllabus statements and answers to Frequently Asked Questions can be found at <http://www.colorado.edu/disabilityservices>.

**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.

**Classroom Behavior Policy:** Students and faculty each have responsibility for maintaining an appropriate learning environment. Students who fail to adhere to such behavioral standards

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

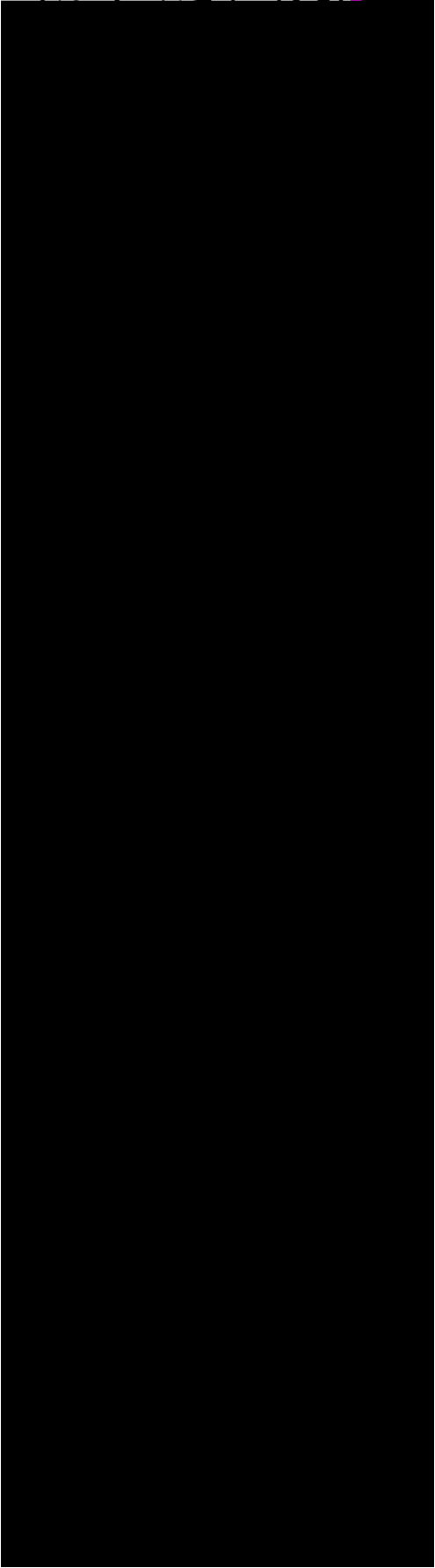
[http://www.colorado.edu/studentaffairs/judicialaffairs/code.html#student\\_cod](http://www.colorado.edu/studentaffairs/judicialaffairs/code.html#student_cod)

**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 [honorcode.colorado.edu](http://honorcode.colorado.edu) or

<http://www.colorado.edu/policies/honor.html>

**Discrimination & Harassment Policy:** The University of Colorado at Boulder Discrimination and Harassment Policy and Procedures, the University of Colorado Sexual Harassment Policy and Procedures, and the University of Colorado Conflict of Interest in Cases of Amorous Relationships Policy apply to all students, staff, and faculty. Any student, staff, or faculty member who believes s/he has been the subject of sexual harassment or discrimination or harassment based upon race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender



(Left: A true story.)

Many of us struggle with math at some point in our lives. The goal of this class is to help you develop your ability to do math. If you're struggling with something - that's ok! Many of the mathematical concepts and tools we take for granted nowadays involved frustrating processes of failing until success. Don't give up! The widespread myth that some people are "just good at math" and others "are not math people" is exactly that - a myth. With enough effort and practice, you can become proficient at any kind of math.

I cannot overstate the importance of practice. Solve problems until you think you have the process memorized, and then add a variation and solve some more. Try to prove statements until you succeed, or write yourself into a contradiction or absurdity. At least a problem every day is a good idea. There are problems in the book with solutions in the back - use them to check your work. Come to me if you want more problems, or to discuss your practice. I want to help you succeed - don't hesitate to reach out.

The most transferable skill you can take from this class is how to persevere in the face of frustration. Don't get discouraged! Keep practicing, and you will overcome any mathematical difficulties.

Read more here! ([click](#))

## Course Schedule:

Week	Content
Week 1	Course material: 1.1, 1.2, 1.3 Topics: Numbers, Integer powers, Rules of algebra Assignments: Read <i>The Imaginary That Isn't</i>
Week 2	Course material: 1.4, 1.5 Topics: Fractions, Fractional powers Assignments: PS1 issued
Week 3	Course material: 1.6, 1.7, 2.1 Topics: Inequalities, Intervals and absolute value, Simple equations Assignments: PS1 due, PS2 issued. Read <i>Polya's Problem Solving Techniques</i> .
Week 4	Course material: 3.4, 3.5, 3.6 Topics: Logic, Proofs, Set theory Assignments: Read <i>How to Prove It</i> pages 84-93
Week 5	Course material: 2.2, 2.3, 2.4 Topics: Equations with parameters, Quadratic equations, Linear equations in two unknowns Assignments: PS2 due
Week 6	Course material: Review, <b>Exam 1 (Wednesday)</b> , 2.5 Topics: Nonlinear equations Assignments: PS3 issued, Read <i>How to Solve It</i>