

ECON 1078-003

Math Tools for Economists 1

MWF 2:00 pm - 2:50 pm in ECON 119

Teacher: Akhil Rao

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Class website: D2L

Office location: ECON 414

Office Hours: MWF 12:30 pm - 1:30 pm, Tuesday 10:00 am - 11:00 am, 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.

**Course Description:** This course is the first of two courses designed to give you the mathematical background necessary for future courses in business and economics. Topics to be covered in this course include basic college-level algebra, simple linear and nonlinear equations, functions and their graphs, systems of equations, set theory, summation, logic and proofs.

**Text:** *Essential Mathematics for Economic Analysis*, 4<sup>th</sup> Edition

**Authors:** Knut Sydsaeter, Peter Hammond, and Arne Strom

### Course Objectives:

After taking this class, you should have an understanding of:

1. Basic college algebra: including real numbers, integer powers, basic algebraic identities and expressions, factoring, fractions, rational exponents, inequalities, intervals and absolute values.
2. Equations: including how to solve simple linear equations (with parameters), systems of two linear equations, quadratic equations and other non-linear equations.
3. Set Theory and an introduction to logic (including necessary and sufficient conditions).
4. Summation notation and working with summations (vital for Econ 3818).

and the following topics relating to functions:

1. The basics: Includes the definition of a function, notation, domain and range, and graphs of functions.
2. Linear functions: Includes slopes, the general equation for a straight line, slope-intercept form, graphing, linear inequalities, and linear models.
3. Quadratic functions and how they can apply to economic models (e.g. a simple monopoly model).
4. Polynomials: Includes factoring polynomials, division, and rational functions (these skills are often employed in Econ 3070).

5. Exponential and logarithmic functions used extensively in intermediate economics courses (e.g. when presenting positive, monotonic transformations).
6. Important function properties and techniques: Includes products and quotients, shifting functions, and composite functions.

- { You may work with up to 3 other students to solve problem sets. You must list the students you worked with at the top of your submission.
- { Information about assignments will be given in class, on the syllabus, and on D2L. You are responsible for keeping track of assignment due dates and submission guidelines.
- { **No late assignments will be accepted under any circumstances.**

### **Attendance**

- { Attendance is expected and will be taken via clicker beginning in week 2. Your lowest 3 clicker scores will be dropped.
- { Each clicker question will be worth 3 points: 2 for attendance, and 1 for correctness.
- { Students are responsible for all missed work, regardless of the reason for absence.
- { Using multiple clickers to answer a question for someone who is absent is not allowed. Such instances will be treated as cheating by all involved, and followed up on accordingly.

### **Computers, calculators, and clickers**

- { I encourage you to use tools like graphing calculators/websites and computer algebra systems to better understand the material and work through the problem sets. However, "because my calculator said so" is not a sufficient answer to a question with computations.
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**Letter Grade Distribution:**

$\geq 94.00$	A		73.00 - 76.99	C
90.00 - 93.99	A-			

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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 identity, gender expression or veteran status should contact the Office of Discrimination and Harassment (ODH) at 303-492-2127, or the Office of Student Conduct (OSC) at 303-492-5550. Information about the ODH, the above referenced policies, and the campus resources available to assist individuals regarding discrimination or harassment can be obtained at <http://www.colorado.edu/odh>.

