# Syllabus Math Tools for Economists I ECON 1078-003 2015 Fall

Instructor: Sihong Xie Class Meeting: MWF 10:00AM – 10:50AM, HLMS267 Office Location: Economics Building Room 307 Office Hours: Tues 12:30pm- 1:30pm & Thurs 3:30pm-4:30pm and by appointment Class Website: Desire2Learn (D2L) Email Address: sihong.xie@colorado.edu

*This is the best way to contact me outside of my office hours. Please allow me 24 hours to respond.* 

# **COURSE DESCRIPTON & OBJECTIVES**

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.

Math is learned and mastered through practice. Anyone who practices math is capable of doing math well. To help you practice math, I will assign you homework daily, and ask you to do clicker questions and inclass assignments.

After taking this class, you should understand the following introduction topics on college algebra.

- 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).

You should also understand the following topics on 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.
- 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.

# **EXPECTATIONS**

You can expect me to:

- be prepared for the day's work and do my best to assist you in your course work .
- treat you equally, be professional and respectful at all times.
- be available in my office hours, ask thoughtful questions and give my full attention.

You are expected to:

- regularly attend class, arrive and leave on time, and silence their phones.
- complete all assignments and turn in work on time.
- be respectful to others and cooperate with your cohorts.
- ask questions and take co-responsibility for creating a meaningful class.

#### **REQUIRED TEXT**

Essential Mathematics for Economic Analysis, 4th, by Kurt Sydsaeter, Peter Hammond, and Arne Strom. You will also use this book for Econ 1088, so I suggest buying one rather than renting it. Previous editions of the text are also acceptable to use, however the page numbers might be different.

# **CALCULATORS**

# Calculators will NOT be allowed during exams!!!

I want you to understand what you are doing and calculators are a major impediment to understanding, so you don't need a calculator in this course. I will make sure that any actual calculations you need to perform on the tests will be very straight forward, but I want you to understand what you are doing.

# ATTENDANCE/CLASS PARTICIPATION

Attendance is required for this course, and you will not do well in this course unless you attend every class. We will use clickers in this class. Your attendance/class participation grade will come from clicker participation.

# **Homework**

I will assign homework daily. It is your responsibility to do all of the homework problems to make sure you are getting sufficient practice with the material. To encourage practice and completion of homework assignments, there will be several graded in-class assignments and exams in this course. **Homework is NOT graded**, but note that doing the homework will most definitely improve your in-class assignment grade, exam grade and your overall grade.

#### NOTES

I do not distribute my lecture notes. I will ask you do small practice problems along with lectures during class, so it is a good idea to bring a **spiral note book and pens** to work with me in class. If you must miss lecture for any reason, please be sure to obtain the notes from a classmate and come to my office hours to discuss any of the material from lecture.

# **Office Hours**

Office hours are established to help you succeed. You should use them as a resource to get extra help on lecture material, problem sets, express concerns or difficulties in your study, and to explore ideas you are interested in. Coming to office hours is a good indication that you care about your study enough to take extra steps.

As a way to better to know you, I ask each of you to individually meet me in my office for 10-15 minutes during the first three weeks. I will bring a sign-up sheet during the first week so you can arrange a meeting with me.

#### **EMAIL**

I encourage you to email me with any questions and concerns. Please be polite and considerate in all email communications. I will do my best to respond within 24 hours. This response may come in the form of an email directly back to you or, if the answer would be beneficial to the entire class, a mass email communication to the class or an announcement during the lecture.

#### **ASSESSMENT and GRADING**

Evaluations will take the following forms:

Clickers	20%
In-class Assignments	20%
Midterm Exam 1	15%
Midterm Exam 2	15%
Final Exam	30%

All exams are closed-book exams. All you need bring to exams are pencils.

I reserve the rights to curve the grades for any individual exam or course overall.

Clickers:	Each clicker question will be worth 2 points. You will earn 1 point for
	answering the question and 1 point answering the question correctly. You are
	encouraged to discuss the questions with your neighbors to come to an answer.
	I will not begin clickers until Monday, August 31. You will need to have your

	clicker and book by that date. The lowest 20% of total clicker points will be			
	dropped.			
In-class	Throughout the semester, I will give several in-class assignments. You can use			
Assignments	your lectures notes and your text book to help you work out the problems.			
	in-class assignments can be taken in groups of up to 5 students per			
	group. Groups are assigned randomly each time. I encourage you to thoroughly			
	discuss problems with your group member and submit one set of solution per			
	group. All in-class assignments will be graded and each member in a group will			
	get the same grade for an assignment. The lowest 20% of total points of in-class			
	assignments will be dropped. THERE ARE NO MAKE UP for In-class			
	assignments. If you miss an assignment, then it will simply be your lowest score			
	and it will be dropped.			
<u>Midterm Exam 1</u> :	The first midterm exam will take place on <b>Friday</b> , <b>September 25</b> , <b>2015</b> during			
	the regularly scheduled class time. It will cover topics from chapters 1 and 2:			
	algebra, simple linear and nonlinear equations. There will be no makeup exam			
	given.			
<u>Midterm Exam 2</u> :	The second midterm exam will take place on <b>Friday, October 23, 2015</b> during			
	the regularly scheduled class time. It will cover topics from chapter 4:			
	Functions, Graphs, Exponential and Logarithms. There will be no makeup exam			
	given.			
<u>Final Exam</u> :	The final exam will take place on <b>Wednesday, December 16, 2015</b> from			
	4:300PM to 7:00PM (2.5 hours). Fifty percent (50%) of the questions will be			
	material covered in lectures and class materials <u>before</u> the midterm exam 2,			
	and fifty percent (50%) of questions will be material covered in lectures and			
	class materials <u>after</u> the midterm exam 2. There will be no makeup exam given.			
	If you have three or more final exams (including mine) scheduled for the same			
	day, you can reschedule my final exam if you would like. If so, you are required			
	to let me know by <b>Friday, October 2nd, 2015.</b>			

Grades will be determined as follows:

Your Score	Grade	Your Score	Grade
94.00 - 100	А	73.00 - 76.99	С
90.00 - 93.99	A-	70.00 - 72.99	C-
87.00 - 89.99	B+	67.00 - 69.99	D+
83.00 - 86.99	В	63.00 - 66.99	D
80.00 - 82.99	B-	60.00 - 62.99	D-
77.00 – 79.99	C+	59.99 and below	F

# Late Assignments/ Missed Examinations Policy

If you miss the midterm or the final exam, you will receive no credit. If a family emergency or health emergency arises, immediately contact me. Then schedule a meeting with me and bring a documented medical or family emergency notification. Missed exam will be given no weight in the calculation of the final grade and other exams will be reweighted accordingly. There will be **no make-up exams**.

If you are a student athlete, and your game schedules conflicts with exam schedule, please inform me in a written note before **Friday**, **October 2nd**, **2015**, so I can arrange your exam proctored by an athletic administrator.

# **ADDITIONAL INFORMATION**

# Students with Disabilities

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 <u>http://www.colorado.edu/disabilityservices</u>.

# **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 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

# 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; 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 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 <a href="http://www.colorado.edu/odh">http://www.colorado.edu/odh</a>.

# **Tentative Course Schedule**

Date	<b>Course Material</b>	Topics	Notes
8/24-8/28	1.1, 1.2, 1.3	Numbers, Powers, Rules of Alg.	
8/31-9/4	1.4, 1.5, 1.6	Fractions, Fractional Powers,	
		Inequalities	
9/7-9/11	Labor Day, 1.7, 2.1	Intervals & Abs. Value, Simple	
		Equations	
9/14-9/18	2.2, 2.3, 2.4	Equations Continued	
9/21-9/25	2.5, Review, Exam1	Nonlinear Equations	Exam 1, Friday 9/25
9/28-10/2	4.1, 4.2, 4.3	Functions, Graphing	
10/5-10/9	4.4, 4.5, 4.6	Linear Functions, Quadratic	
		Functions	
10/12-10/16	4.7, 4.8, 4.9	Polynomials, Power &	
		Exponential Functions	
10/19-10/23	4.10, Review, Exam2	Logarithms	Exam 2, Friday 10/23
10/26-10/30	5.1, 5.2, 5.3	Shifting Graphs, New Functions	
		from Old, Inverse Functions	
11/2-11/6	5.4, 5.5, 5.6	Graphing equations, Distance in	
		the Plane, General Functions	
11/9-11/13	3.1, 3.2, 3.3	Summation Notation, Rules	
		Of Sums, Double Sums	
11/16-//20	3.4, 3.5, 3.6	Logic, Proofs, Set Theory	
11/23-11/27	Fall Break		
	3.7, 15.1, 15.2	Induction, Systems of Linear	
		Equations, Matrices and Matrix	
		Operations	
11/30-12/4	15.3,15.4	Matrix Multiplication, Rules of	
		Multiplication	
12/7-12/11	Review	Catch up and Review	

Final Exam, Wednesday 12/16, 4:30 pm - 7:00 pm