Department of ECONOMICS
THE UNIVERSITY OF UTAH

ECON 3620-090
Math for Economics
Fall 2017

Instructor: Tanadej Pete Vechsuruck

Time and Location: Online

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Office: Desk 4, Old Law Library (Building 72)

Office Hours: By appointment

Course Description: This course will introduce students on how economists use mathematics as a main tool in their analyses in order to understand, and often apply, economic theory. It is intended to cover several important mathematical concepts that will be studied in the context of their applications to economics theories. Also, it is aimed to develop students' abilities to use mathematical techniques to solve problems in economics applications. At the end of this semester, students would be expected to understand basic mathematical techniques used in economics such as linear algebra, derivative, differential, optimization with and without constraints, and matrix algebra. However, students should be aware that the real use of mathematics in economics is far more advanced than what they will see in the class; therefore, the course is merely designed to be the first step for those who are interested in mathematical economics.

Course Objectives:

- Student will be able to recognize components of functions used in economics theory.
- Students will be able to to integrate Math skills in solving economics problems.
- Students will be able to recognize how Math and previously learned theories are integrated and applied in academic journals or contemporary research.
- Students will be able to build confidence in using Math skills to help complete advanced economic classes.
- Students will be able to think about and develop strategies for learning Math, e.g. to solve problems and develop good study habits and skills.

Prerequisites: College Algebra, ECON 2010 and ECON 2020
Textbooks:

- **(Required)** Edward T. Dowling (2011), *Schaum's Outline of Introduction to Mathematical Economics*, 3rd Edition, Publisher: Mcgraw Hill.

- (Optional) Michael Hoy, John Livernois, Chris McKenna, Ray Rees and Thanasis Stengos (2011), *Mathematics for Economics*, 3rd Edition, Publisher: The MIT Press

Grading: There will be ONE 'Module' assigned for each week on Canvas in which the reading lists, videos and homework will be explained. You are required to review the assigned reading, watch the videos and work on the assignments. Assignments can be classified as:

- ***Discussion (10%):*** You are expected to participate in five discussions throughout the semester. Active participation and responses are highly encouraged. All comments must be related to the topic and show respect to your classmates.

- ***Practice Problems (5%):*** There will be weekly Practice problems to work on. The problems are from the textbooks, and the solutions will be provided (or else it would be indicated). I will assign a specific number of questions in each Module. There is no point assigned directly on the Practice Problems. However, after you finish the Practice Problems, you need to finish the 'Practice Problem Completion Check to confirm you did finish the Practice'. The checklists overall contribute 5% to your total grade. Keep in mind that this is the most important exercise that could sharpen your expertise on this course's materials. The more you work on them, the more you would become better! The checklists will be due at the following Monday NOON.

- ***Weekly Homework (10+15= 25%):*** There are two components of Weekly Homework: Weekly Quizzes and Weekly TWO Math Problems. Weekly Quizzes, all in multiple choice questions, will be available on Canvas. Weekly TWO Math Problems' questions can be viewed/printed from Canvas on each Module. Students must work on paper or tablet and submit your work on Canvas in pdf format. Both types of homework are due at the following Monday NOON. In addition, I will drop Six lowest scores out of calculation (three each).

- ***Learning Plan (5%):*** You will be assigned to draft a Learning Plan for this course at the beginning and review/adjust it in the middle of the course. The purpose of this assignment is to encourage you to take the ownership of your learning process and think about how you are planning to work through the course. You will not be graded on what strategies you will be using. The Plan should supposedly guide you what activity you need to perform on each day in the week. This is because, I believe, work discipline is by all means the crucial element to succeed in any job including studying in the college and any career you pursue in the future.

- ***Reflection (10%):*** To understand your feeling and perspective towards the course are important for me to improve and adjust this course to meet our mutual goals. You will be asked to write a Reflection paper at the beginning, in the middle, and at the end of course.

- ***Midterm (20%) + Final (25%) Exams:*** Students will need to take two proctored exam in person (mid-term, and final exam). Both Exams are closed books/notes. Only

a simple/scientific calculator and a one-page, single-sided, letter size notes are allowed. Here is the information on how to sign up for the proctored examinations. Use the "Schedule Exams"link in the course menu to register for your exam. Please make sure to sign up for the exams in advance, so you don't miss out exams or cannot select the date you prefer.

Grading Scale:

93-100 → A	90-92.99 → A-	87-89.99 → B+
83-86.99 → B	80-82.99 → B-	77-79.99 → C+
73-76.99 → C	70-72.99 → C-	67-69.99 → D+
63-66.99 → D	60.62.99 → D-	0-60 → E

Expectations of Instructor and Students:
Instructor: I will be your guide by your side through the learning process. You can expect to receive message and Announcement me in this course several days a week. I will be available to you in several ways. If you have questions related to the course materials, please post the question in the "Class Forum" discussion board. Your peers may benefit from reading our answers and this also saves me from emailing more than one student the same answer. If you need to discuss some issues considered emergency or personal matters, please send a message through Canvas or email me and I will respond as soon as I can. I am also available for office visit/consultation by appointment as needed. You can expect to hear back from me within 24 hours for email and message, and 72 hours for assignment feedback. If you don't hear back, feel free to contact me.
Student: I expect students to log into the course on a daily basis, if possible. To turn on notifications is highly recommended, so you won't miss any feedback or message from me. You can do it by click 'Account' on the left tab of Canvas and click on 'Notifications'. You will be at the page that you can set the notification as you want. I would suggest that at very least Announcement, Submission Comment, Discussion and Conversation Message should be set as 'Notify me right away'. Also, I expect you to complete work in a timely manner and ask questions if you struggle on anything. Communication is a key for students who succeeded in the past. Therefore, if they is anything wrong with you, your classmate or the course, please contact me right away.

American with Disabilities Act (ADA) statement:
The University of Utah seeks to provide equal access to its programs, services and activities for people with disabilities. If you will need accommodations in the class, reasonable prior notice needs to be given to the Center for Disability Services (CDS), (162 Union Building, Salt Lake City, Utah 84112). CDS will work with you and the instructor to make arrangements for accommodations (see this link). Additionally, the University of Utah seeks to provide equal access to its programs, services and activities for people with disabilities. If you need accommodations in this class, reasonable prior notice needs to be given to the

instructor and to the Center for Disability Services, check this link or call 801-581-5020 to make arrangements for accommodations.

University Policies:

- Academic (Dis)Honesty. Academic dishonesty of any kind is a serious offense, which undermines both the reputation and quality of the degrees issued by the University of Utah. Plagiarism of any kind, intentional and/or unintentional, will result in strict sanctions against the student per university policy. Please meet with me immediately if you are unclear as to what constitutes plagiarism.

- The University Code: Section V.A. Students must adhere to generally accepted standards of academic honesty, including but not limited to, refraining from cheating, plagiarizing, research misconduct, misrepresenting ones work, and/or inappropriately collaborating.

- Section V.B. A student who engages in academic misconduct may be subject to academic sanctions including but not limited to a grade reduction, failing grade, probation, suspension, or dismissal from the program or the University, or revocation of the students degree or certificate.

Tentative Schedule: The schedule below follows the 'Modules' on Canvas. The sequence might be changed or adjusted to suit timeline this semester. All readings and assignments will be clarified more in details in 'Modules'.

Module	Start and End Dates	Topic	Notes
1	8/21/2017 - 8/27/2017	Introduction to Math for Economics and Prerequisite Review	
2	8/27/2017 - 9/4/2017	Linear Equation and Equilibrium Analysis	
3	9/4/2017 - 9/11/2017	Matrix Operations and Determinants	
4	9/11/2017 - 9/18/2017	Minor, Cofactor and Matrix Inversion	
5	9/18/2017 - 9/25/2017	Using Matrix to solve linear equations with multi-variables	
6	9/25/2017 - 10/2/2017	Limit Theorems and Rules of Differentiation	
7	10/2/2017 - 10/16/2017	Concavity and Convexity	Fall Break 10/8-10/15
8	**10/16/2017 - 10/23/2017**	**Midterm Exam**	**exam window: 10/17-10/21**
9	10/23/2017 - 10/30/2017	Partial Differentiation	
10	10/30/2017 - 11/6/2017	Total Derivative and Total Differentials	
11	11/6/2017 - 11/13/2017	Optimization of Multivariable functions	
12	11/13/2017 - 11/20/2017	Optimization with constraint: Lagrangian	
13	11/20/2017 -11/27/2017	Optimization with constraint : Lagrangian (continued)	
14	11/27/2017 - 12/4/2017	Comparative Statics	
15	**12/4/2017 - 12/11/2017**	**Final Exam**	**exam window: 12/5-12/12**