

# Econ 8370 Online - Mathematics for Economics

Department of Economics  
University of Missouri  
Fall 2018

## Course Description

The aim of this course is to cover essential mathematics used in economics. Topics include introductory linear algebra, multivariate calculus, comparative statics analysis, unconstrained optimization, and equality constrained optimization. May be repeated for credit. Prerequisites: ECONOM 4351 or equivalent; MATH 1320 or equivalent. Graded on A-F basis only.

## Class Format

This class uses Canvas for all content delivery and assignments.

## Instructor

Saku Aura  
Office: Professional Building 232  
Phone: 882 6073  
Email: [auras@missouri.edu](mailto:auras@missouri.edu)  
Webpage: <http://faculty.missouri.edu/~auras>

## Textbooks

Mathematics for Economics. Hoy, Livernois, McKenna, Rees, Stengos. MIT Press, 2011.

## Other course content

The online content of the class will lecture notes, problem sets, sample solutions and link to videos and other material related to the class. All this material is copyrighted and is not to be shared outside the use in this class.

## **Class progress**

This class lasts 14 weeks and for each week there is a module of material to cover. For every week or two weeks, there is also homework due on the following Wednesday morning by 8 am (CST). This means that a module that starts Monday will have homework due in 9 days time at the earliest. It is your responsibility to cover the material provided and do the homework within that time period.

## **Grading**

The grading on this course is based on the exams (midterm and a final) and problem sets. The relative weights of these for the final grade are:

Final exam: 40%

Midterm: 35%

Problem sets: 25%

Forum participation: 5% (extra credit potential)

Note that + and – modifiers will be used.

## **Exams**

This class will have two 24-hour take-home exams. This means that on Tuesday 10/16 and Tuesday 12/11 on 8 am CST I will release the questions via canvas. You will have until Wednesday 8 am CST the following day to answer the questions and post your answers via Canvas.

The take-home exams are open book, open internet access exams. What you are not allowed to do is to consult anyone else, including your classmates, during the take home for help. There will be some easier and some harder questions on each exam to test the learning. While each individual is different in their time management, my goal is that most of you would be able to complete the exam in 2 hours.

## **Problem Sets**

I will regularly assign problem sets based on the material we have learned. These problem sets will count for 15% of the course grade. Your problem sets should be submitted in a format that Canvas understands, preferably as PDF files.

An obvious way to create a PDF of your problem set answers is to use a computer program such as Microsoft Word, or even better, L<sup>A</sup>T<sub>E</sub>X or another such specialized program. While

this would be convenient for me, I do not necessarily recommend this for most students: writing mathematics on a computer is a very time-consuming activity. Instead, I would recommend handwriting the solutions and scanning them with either a scanner or many of the possible Smartphone scanner programs that create PDFs. If you go this second route, please use plain white paper for your answers: this makes for the easiest to read solutions. A stylus and a tablet computer are also possible solutions.

For home works and the exams, setting up the problem correctly is the most valuable part. Please write answers that provide enough intermediate steps for us to follow your thought process. A simple answer stating just, say, " $x=2$ " is worth nothing in the exam or the homework regardless if it is correct. On the other hand, an answer that gets the algebra wrong but the thought process right can be worth almost the full credit.

Cooperation in home works is not only allowed, but it is actively encouraged. The home works are a primary learning tool in this class, and it is my hope that we will have an active discussion about the homework problems online. I also strongly encourage you to try all the odd-numbered textbook questions which have solutions provided at the end of the book.

## **Online Forums**

Within the Canvas site, you will find a discussion forum for this class. This should be one of the primary ways to communicate in this class. If you find some concepts unclear, please do not hesitate to ask on this forum. This is preferable to emailing me since others might be stuck with exactly the same issue.

Active participation in the forum can earn you extra credit. This can be for asking or answering questions. For homework questions do not provide the whole answer in the forum, but instead, provide a hint to how to proceed. The instructor will also monitor the forums and participate in the discussions.

## Schedule

Week	Starting	Topic	Chapters
1	08/20/18	Review of Fundamentals	1,2
2	08/27/18	Sequences Series and limits	3
3	09/03/18	Continuity	4
4	09/10/18	Univariate Calculus	5
5	09/17/18	Univariate Optimization	6
6	09/24/18	Systems of linear equations	7
7	10/01/18	Matrices	8
8	10/08/18	Determinants and the Inverse Matrix	9
9	10/15/18	Some Advanced topics in Linear Algebra	10
	10/16/19	Exam	
10	10/22/18	Multivariate Calculus	11
11	10/29/18	Multivariate Calculus	11
12	11/05/18	Multivariate unconstrained optimization	12
13	11/12/18	Constrained Optimization	13
	11/19/18	Thanksgiving Break	
14	11/26/18	Comparative statics	14
15	12/03/18	Inequality Constraints and optimization	14,15
	12/11/18	Exam	

## ADA

Students with Disabilities:

If you anticipate barriers related to the format or requirements of this course, if you have emergency medical information to share with me, or if you need to make arrangements in case the building must be evacuated, please let me know as soon as possible.

If disability related accommodations are necessary (for example, a note taker, extended time on exams, captioning), please register with the [Office of Disability Services](#), S5 Memorial Union, 573-882-4696, and then notify me of your eligibility for reasonable accommodations.

## Intellectual Pluralism

The University community welcomes intellectual diversity and respects student rights. Students who have questions or concerns regarding the atmosphere in this class (including respect for diverse opinions) may contact the departmental chair or divisional director; the director of the [Office of Students Rights and Responsibilities](#); the [MU Equity Office](#), or [equity@missouri.edu](mailto:equity@missouri.edu).

All students will have the opportunity to submit an anonymous evaluation of the instructor(s) at the end of the course.

## **Intellectual Property Notice**

All course materials including but not limited to the syllabus, course assignments, study guides, learning guides, online lecture videos and content, and lab book (i.e. course pack) are property of the instructor and University and may not be shared online or distributed in any manner to others. Students are prohibited from posting course materials or notes online and from selling notes to or being paid for taking notes by any person or commercial firm without the express written permission of the professor teaching this course. Doing so will constitute both an academic integrity violation and a copyright violation. Violations of copyright laws could subject you to civil penalties and criminal liability. Violations of academic integrity may subject you to disciplinary action under University policies.