

Department of Economics and Finance

ECON*4700 – Advanced Mathematical Economics
ECON*6060 – Mathematical Methods for Economics
Advanced Mathematical Economics
Fall 2013

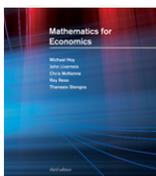


Chris McKenna: MACK 704, ext 53274
Email: cmckenna@uoguelph.ca
Lectures: T, Th, 11:30 – 12:50, MACK 307
Lab: W, 14:30 – 15:20, MACK 306
Office hours: T, Th, 14:00 – 15:30, or by appointment.

Course outline

Description: This is an advanced undergraduate course in mathematical economics, with selected applications. The first six weeks focuses on multivariate techniques and the second part of the course studies topics in dynamic analysis. Both parts are accompanied by many applications to economics. The first six weeks is a combined course with ECON*4700 and ECON*6060. The second part of the course is for ECON*4700 only.

Main text: Hoy, M., J. Livernois, C. McKenna, R. Rees, and T. Stengos., *Mathematics for Economics*, MIT Press, 3rd Edition. [Hoy]



There is also a Student Solutions Manual, which is available as an e-book via the MIT Press website, or in hard copy at the bookstore and Amazon.ca. Supplemental material is available at the book's website:
http://mitpress.mit.edu/math_econ3/

The text is on reserve in the Library.

I will be making some use of illustrations and simulations using *Mathematica*, for which you will need to download the **free** Wolfram CDF Player at www.wolfram.com (You do not need the full *Mathematica* program and you do not need to know the *Mathematica* programming language.)

On-line resources: All course material, including lecture PPTs, CDFs, Weekly Exercises and their Answers will be posted on Courselink each week. The weekly exercises are not for credit, they are simply a study aid.

Evaluation (4700): There will be two in-class **midterm exams** (worth 30% each) scheduled for Tuesday, 8 October and Thursday, 1 November. The **final exam** (40%) is Dec.3rd from 7-9 pm. There will be no make-ups for missed midterms and the weight will be shifted to the Final.

Evaluation (6060): There will be one final examination, which will be pass/fail, date TBA during Week 7 (i.e., the beginning 21 October).

Student responsibilities: You should be aware of your responsibilities regarding University policies on academic misconduct, drop dates, email communication and course requirements. You are advised to visit:

<http://www.uoguelph.ca/economics/node/1115>

Class etiquette and communication protocol

Out of respect for your classmates, and me do not use cell phones for any form of communication during class. You are welcome to use laptops or tablets to take notes.

I receive a large number of emails each day. Please put the course number in the subject line and restrict your email questions to ones requiring only short answers. I will not be able to answer technical questions by email – it takes too long. Email is by far the best way to contact me, and I can generally get back to you within two hours.

A word (or two) of advice...

The only way to learn mathematical economics is to do it. Memorization isn't enough and it is very easy to deceive yourself that you have grasped a concept and that you can apply it appropriately. Test yourself using the weekly exercises and identify weaknesses early. The rewards to getting to grips with the material in this course are huge and it will make your progress through your program all the smoother. Finally, do not gamble on shifting weight to the final, it increases stress and is never successful.

Course content

(Timing is approximate)

- Week 0 (First class meeting, 6 September):
Course overview and review of basics. Hoy Chs 2 – 10.
- Week 1 & 2: Review of calculus and optimization of multivariate functions. Hoy Chs 11, 12 & 13.
- Week 3 & 4: Comparative statics. Hoy Ch 14.
- Week 5: Concave programming. Hoy Ch 15.
- Week 6: Integration. Hoy Ch 16.
- Week 7: First-order differential equations. Hoy Chs 21 and 22.
- Week 8: Second-order differential equations. Hoy Ch 23.
- Week 9: Differential equation systems. Hoy Ch 24.
- Week 10 & 11: Dynamic optimization. Hoy Ch 25.

Please Note: You will be asked to complete an evaluation of this course during the last two weeks of the semester. The Department of Economic Policy regarding the conduct and use of these evaluations will be found at:

<http://www.uoguelph.ca/economics/academics/courses/course-evaluation>

The Department of Economics and Finance *Learning Objectives (skills and knowledge competencies)* for this course:

Skills:

- a) ***Written communication***—although this is a mathematical economics course, you will need to provide written commentaries on your steps and to explain your results.
- b) ***Numerical problem solving***—achieve a high level of numeracy skills.
- c) ***Analytical problem solving***-become familiar with various techniques for solving formal economic models, and learn the appropriate mathematical tool to apply to an economic problem.

Knowledge:

- a) ***Microeconomic modelling***: ***Apply*** techniques of multivariate calculus, integral calculus and dynamical methods to a variety of microeconomic problems.
- b) ***Macroeconomic modelling***: ***Apply*** calculus and dynamic methods to a variety of macroeconomic models such as models of growth and the business cycle.
- c) ***Mathematical techniques***: be familiar with a variety of standard mathematical techniques used frequently in economics, such as constrained optimization and dynamic systems.