

Mathematical Methods in Economics - ECON 3001A

Carleton University
Department of Economics
Summer-2019

Instructor: Abdallah Zalgout

Class Hours: M and W 6:05pm - 8:55 pm

E-mail: abdallahzalgout@cmail.carleton.ca

Class Room: SA 306

Office Hours: Monday 3:30 pm - 4:30 pm

Tutorial Hours: M and W 4:35pm - 5:55 pm

Office Hours Room: LB B842-B

Tutorial Room: SA 306

Course Description

This course is designed to provide students with a knowledge of some of the basic mathematical tools used in economic theory. Topics include: Concave and convex functions; homogeneous and exponential functions; equilibrium analysis; linear models and matrix algebra; comparative static methods; constrained optimizations with more than one choice variable; optimization with inequality constraints; implicit functions and implicit differentiation; applied to models.

Prerequisites

ECON 1000 or FYSM 1003 with a grade of C- or higher, and ECON 1401 and ECON 1402 (or equivalent) with a grade of C- or higher in each and a grade point average across the two of 6.50 or higher. Students who believe they have taken a similar background course or courses from another university must provide appropriate documentation to the Department of Economics Undergraduate Administrator, Amanda Wright. A grade of C+ or higher is required to qualify for ECON 4001, ECON 4020, and ECON 4021. (Deferred Final Grade) status at the end of this course precludes (continued) registration in any other course for which the former is a prerequisite.

Textbook

Required Textbook

- *Fundamental Methods of Mathematical Economics*, by A.C. Chiang and K. Wainwright. McGraw Hill, 4th edition, 2004.

Other References

- *Essential Mathematics for Economic Analysis*, by K. Sydsæter and P. Hammond. FT Prentice Hall, 3rd edition, 2008
- *Mathematics for Economists*, by C. P. Simon and L. E. Blume. W. W. Norton & Company, 1994.
- *Economist's Mathematical Manual*, by K. Sydsæter, P. Berck, and A. Strøm. Springer, 4th edition, 2005.

Statement of Expectations

It is assumed that students who have the prerequisites for this course and are therefore allowed to remain enrolled, have in fact learned all of the associated materials. Students should refer back to their notes and/or textbooks from prerequisite courses if they believe they need to refresh their knowledge of the following materials covered in MATH/ECON 1401 and MATH/ECON 1402 as outlined in the official Calendar descriptions for these courses:

- Functional relations: including functional forms and error terms.
- Graphing economic magnitudes: scatter diagrams, time-series graphs, and functional relationships.
- Applied calculus: the mechanics of differentiation and integration, elasticity, and consumer/producer surplus.
- Applied algebra: solving systems of linear equations and Keynesian national income analysis.
- Approaches to (mathematical) problem solving.
- Calculus: including partial differentiation, definite and indefinite integrals, techniques of integration, and unconstrained optimization.
- Vectors and matrices: scalar multiplication, inner product, linear dependence, matrix operations, rank, invertible matrix theorem, and determinants.
- Economic applications such as profit and utility maximization.

Topics

The following outlines the list of major topics to be discussed throughout the semester. The amount of time devoted to each will vary.

Topic	Chapter
Introductory material	Revision
Linear models and Matrix Algebra	Chapters 4,5
Derivatives and Comparative Statics	Chapters 6,7,8
Optimization	Chapter 9
Exponential and Logarithmic Functions	Chapter 10
Multivariable Optimization	Chapter 11
Constrained Optimization	Chapters 12, 13

Tutorials will be used to expand on material taught during regular lectures, providing additional examples as well as the opportunity to discuss the solutions to the problem sets and other questions.

Grading

Marks are based on three exams. Weights are as follows:

	Weight
Two assignments	each 10%
Midterm Exam	35%
Final Exam	45%

Students who can document a compelling reason for missing any of the two exams will be excused. In such cases, students must inform the instructor of such an absence in advance if possible. If the midterm exam to be missed, its weight will be moved to the final. Students must fulfill all of the preceding course requirements in order to achieve a passing grade (D- or higher). Application to write a deferred final examination must be made at the Registrar's Office.

Plagiarism

Please be aware that plagiarism is serious offence at Carleton and should be recognized and avoided. For further information on how to do so, please see "Pammett on Plagiarism and Paraphrasing by clicking [here](#).

Accommodation Statement

You may need special arrangements to meet your academic obligations during the term. For an accommodation request the processes are as follows:

- **Pregnancy obligation:** write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details visit the Equity Services [website](#).

- **Religious obligation:** write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details visit the Equity Services [website](#).
- **Academic Accommodations for Students with Disabilities:** The Paul Menton Centre for Students with Disabilities (PMC) provides services to students with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability requiring academic accommodations in this course, please contact PMC at 613-520-6608 or pmc@carleton.ca for a formal evaluation. If you are already registered with the PMC, contact your PMC coordinator to send me your Letter of Accommodation at the beginning of the term, and no later than two weeks before the first in-class scheduled test or exam requiring accommodation (if applicable). After requesting accommodation from PMC, meet with me to ensure accommodation arrangements are made. Please consult the PMC website for the deadline to request accommodations for the formally-scheduled exam (if applicable) at <http://www2.carleton.ca/pmc/new-and-current-students/dates-and-deadlines/>

You can visit the Equity Services website to view the policies and to obtain more detailed information on academic accommodation by clicking [here](#).