Mathematical Methods in Economics - ECON 3001B
Carleton University
Department of Economics
Winter-2019

This is a tentative syllabus and small changes may be made to it up until December 28.

Instructor: Abdallah Zalghout  
E-mail: abdallahzalghout@cmail.carleton.ca

Class Hours: Th 6:05pm - 8:55 pm  
Class Room: SA 304

TA: Branden Mac Innis-Morris  
E-mail: brandenmacinnismorri@cmail.carleton.ca

Tutorial Hours: Th 4:05pm - 5:25 pm  
Tutorial Room: SA 304

Office Hours: Monday 1:30 pm - 2:30 pm  
Office Hours Room: LB B842

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

Other References

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.
<table>
<thead>
<tr>
<th>Topic</th>
<th>Chapter</th>
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</thead>
<tbody>
<tr>
<td>Introductory material</td>
<td>Revision</td>
</tr>
<tr>
<td>Linear models and Matrix Algebra</td>
<td>Chapters 4,5</td>
</tr>
<tr>
<td>Derivatives and Comparative Statics</td>
<td>Chapters 6,7,8</td>
</tr>
<tr>
<td>Optimization</td>
<td>Chapter 9</td>
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<tr>
<td>Exponential and Logarithmic Functions</td>
<td>Chapter 10</td>
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<tr>
<td>Multivariable Optimization</td>
<td>Chapter 11</td>
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<tr>
<td>Constrained Optimization</td>
<td>Chapters 12, 13</td>
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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:

<table>
<thead>
<tr>
<th>Date</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Exam I</td>
<td>January,31</td>
</tr>
<tr>
<td>Exam II</td>
<td>March,7</td>
</tr>
<tr>
<td>Final Exam</td>
<td>TBD</td>
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</tbody>
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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 Exam I or Exam II to be missed, the weight of that exam 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.

**Accomodation 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.