ECON 3001 A: Mathematical Methods of Economics
2017 Winter
Carleton University
Department of Economics
Instructor: Eric Stephens
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Loeb Building D-898

Meeting Times:

Office hours: Fridays 12-2 p.m.
Website: Accessible through cuLearn at https://www.carleton.ca/culearn

Course Objectives:

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; matrix algebra; implicit functions and implicit differentiation; comparative static methods applied to models such as utility maximization and least-cost production; constrained optimization; the envelope theorem.

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. DEF(ered final grade) status at the end of this course precludes (continued) registration in any other course for which the former is a prerequisite.

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. In particular, students are expected to know fairly well the materials covered in MATH/ECON 1401 and MATH/ECON 1402 as outlined in the official Calendar descriptions for these courses:

1. Functional relations: including functional forms and error terms.
3. Applied calculus: the mechanics of differentiation and integration, elasticity, and consumer/producer surplus.

5. Approaches to (mathematical) problem solving.

6. Calculus: including partial differentiation, definite and indefinite integrals, techniques of integration, and unconstrained optimization.


8. Economic applications such as profit maximization, comparative statics, and the Leontief input-output model.

No explicit review of the foregoing will be undertaken. Students should refer back to their notes and/or textbooks from prerequisite courses if they believe they need to refresh their knowledge of associated materials.

Required Textbook:

The course will follow *Fundamental Methods of Mathematical Economics*, 4th edition, McGraw Hill, by A.C. Chiang and K. Wainwright. All other course materials will be provided either in class or on the web-page at https://www.carleton.ca/culearn.

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>Chapters</th>
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<tbody>
<tr>
<td>Introductory material</td>
<td>1-3 (covered very briefly)</td>
</tr>
<tr>
<td>Linear models and Matrix Algebra</td>
<td>4,5</td>
</tr>
<tr>
<td>Derivatives and Comparative Statics</td>
<td>6,7,8</td>
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<tr>
<td>Optimization</td>
<td>9</td>
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<tr>
<td>Exponential and Logarithmic Functions</td>
<td>10</td>
</tr>
<tr>
<td>Multivariable Optimization</td>
<td>11</td>
</tr>
<tr>
<td>Constrained Optimization</td>
<td>12,13</td>
</tr>
<tr>
<td>Integration and Economic Dynamics</td>
<td>14,15</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 assignments, two midterm exams and one final exam (all exams are cumulative). Weights are as follows:

<table>
<thead>
<tr>
<th>Grading Scheme</th>
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<tbody>
<tr>
<td>Assignments</td>
<td>5 %</td>
</tr>
<tr>
<td>Midterm I</td>
<td>20 %</td>
</tr>
<tr>
<td>Midterm II</td>
<td>30 %</td>
</tr>
<tr>
<td>Final</td>
<td>45 %</td>
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</tbody>
</table>

When assignments are due, they are to be submitted to the teaching assistant at the beginning of the tutorial. Assignments will be checked to ensure that a reasonable attempt at all questions was made and given simply a pass or fail (i.e. full marks for a pass, nothing for fail). Students are encouraged to work together on assignments, BUT each student MUST write up his/her assignments independently. Students are also encouraged to work through as many textbook problems as possible, since these are the best way to learn the course material.

There will be no make-up midterm exams. Students who can document a compelling reason for missing a midterm examination will be excused. Students must inform the instructor of such an absence in advance if possible. The weight of an examination missed for valid reasons will be evenly distributed between the remaining examinations. The final examination will be scheduled by the University.

See Academic Regulation 2.3 for the official meanings of final grades, and note that it stipulates that no course grades are final until approved by the Faculty Dean. Note also that course grades may be scaled upwards or downwards in a rank-preserving manner to better fit the relevant departmental distributional norm. Application to write a deferred final examination must be made at the Registrars 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 at https://www.carleton.ca/economics/courses/writing-preliminaries/.

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:  http://www2.carleton.ca/equity/

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.
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 at http://www2.carleton.ca/equity/