Meeting Times:

Lectures: Pre-recorded and posted on the course website.
Tutorials: Tuesdays, 1:05-2:25 p.m, live on BigBlueButton.
Office hours: Thursdays, 11:35-12:55 p.m., live on BigBlueButton.
Website: Accessible through cuLearn at https://www.carleton.ca/culearn
T.A office hours: TBA

This is an online course, where the majority of activities are asynchronous to provide flexibility for students. All those enrolled are expected to remain up to date with the deadlines and due dates provided by the instructor through the website. To interact with the instructor during office hours, students require a computer with reliable high-speed internet access, ideally with a webcam, and a headset with a microphone.

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 on the web-page 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, implicit functions and implicit differentiation. We also study constrained optimization and the envelope theorem, as well as comparative static methods applied to models such as utility maximization and least-cost production. If time permits, we shall provide some coverage of economic models involving integration and differential equations.

Prerequisites:

ECON 1001 or 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 combined grade point average in ECON 1401 and ECON 1402 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. A grade of C+ or higher is required to qualify for ECON 4001, ECON 4020, ECON 4021, ECON 4025, ECON 4026 and a grade of C- or higher for ECON 4053. DEF(errored final grade) status at the end of this course precludes (continued) registration in any other course for which the former is a prerequisite. This class precludes additional credit for ECON 2400 (no longer offered).
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.

Topics:

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

- **Introductory material**
  - Chapters 1-3 (covered very briefly)

- **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

- **Integration and Economic Dynamics**
  - Chapters 14,15
Grading:

Marks are based on 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>Midterm I</td>
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<tr>
<td>Midterm II</td>
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<tr>
<td>Final</td>
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<tr>
<td>20 %</td>
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<tr>
<td>30 %</td>
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<td>50 %</td>
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Assignments will be posted on the course website with solutions. Though not for credit, it is assumed that students will complete all the assignments. Students are also encouraged to work through as many textbook problems as possible, since working through problems is 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 dates for midterm exams will be posted shortly after classes begin and the final examination will be scheduled by the University. Exams may use CoMaS e-proctoring, though this is subject to change. For information, see the following links:

https://carleton.ca/ses/e-proctoring/

https://carleton.ca/ses/wp-content/uploads/CoMaS-Student-Instructions-v.-1.06.pdf

See Academic Regulation 3.2 for the official meanings of final grades, and note that regulations stipulate that no course grades are final until approved by the Faculty Dean. Further, 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 Registrar’s Office.

Plagiarism:

Please be aware that plagiarism is serious offence at Carleton and should be recognized and avoided. For further information, please see “Pammett on Plagiarism and Paraphrasing” at http://www.carleton.ca/economics/courses/writing-preliminaries/.

Online Etiquette

See the following statement regarding etiquette at Carleton:
carleton.ca/online/online-learning-resources/netiquette/
Course Copyright

Classroom teaching and learning activities, including lectures, discussions, presentations, etc., by both instructors and students, are copyright protected and remain the intellectual property of their respective author(s). All course materials, including PowerPoint presentations, outlines, and other materials, are also protected by copyright and remain the intellectual property of their respective author(s). Students registered in the course may take notes and make copies of course materials for their own educational use only. Students are not permitted to reproduce or distribute lecture notes and course materials publicly for commercial or non-commercial purposes without express written consent from the copyright holder(s).

Accommodation Statements:

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

Pregnancy obligation: Please contact your instructor 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: Please contact your instructor 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: If you have a documented disability requiring academic accommodations in this course, please contact the Paul Menton Centre for Students with Disabilities (PMC) at 613-520-6608 or pmc@carleton.ca for a formal evaluation or contact your PMC coordinator to send your instructor your Letter of Accommodation at the beginning of the term. You must also contact the PMC 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 your instructor as soon as possible to ensure accommodation arrangements are made. For more details, visit the Paul Menton Centre website.

Survivors of Sexual Violence: As a community, Carleton University is committed to maintaining a positive learning, working and living environment where sexual violence will not be tolerated, and where survivors are supported through academic accommodations as per Carleton’s Sexual Violence Policy. For more information about the services available at the university and to obtain information about sexual violence and/or support, visit: carleton.ca/sexual-violence-support.

Accommodation for Student Activities: Carleton University recognizes the substantial benefits, both to the individual student and for the university, that result from a student participating in activities beyond the classroom experience. Reasonable accommodation must be provided to students who compete or perform at the national or international level. Please contact your instructor 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.