

**PLEASE NOTE THAT CHANGES COULD BE MADE TO THIS COURSE OUTLINE  
UP TO SEPTEMBER 20, 2022**

**ECON 1402 A**

**Elementary Mathematics for Economics I**

**Professor M. Demers**

**Fall 2022**

**Office: B-855 Loeb**

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**Office Hours: Wednesday 10:00 a.m.-11:30 a.m.**

**TA: Abdou Idissou**

**Email: ABDOUIDISSOU@cmail.carleton.ca**

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**Lecture Time: Wednesday 11:35 a.m. – 2:25 p.m.**

**Place: LA A720**

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**Course Objectives:**

- Learn how to find derivatives of univariate functions and partial derivatives of multivariate functions.
- Learn concavity and convexity of functions and their importance in optimization problems.
- Apply these concepts in economic optimization problems without constraints.
- Apply these concepts in economic optimization problems with constraints.
- Emphasize in class participation in solving practice problems.

**Prerequisite(s):** ECON 1001 or ECON 1000 or FYSM 1003 with a grade of C- or higher, and ECON 1401 or MATH 1401 with a grade of C- or higher.

**Precludes additional credit** for BIT 1000, BIT 1001, BIT 1100, BIT 1101, BIT 1201, BIT 1200, MATH 1007, MATH 1009, MATH 1104, MATH 1107, MATH 1119, MATH 1052, MATH 1152.

**Required textbook for the course:**

Geoff Renshaw, ***Maths for Economics***. Oxford: Oxford University Press, 5<sup>th</sup> edition. ISBN: 978-0-19-883950-7

## COURSE OUTLINE

**Every week part of the lecture time will be devoted to solving practice problems in class.**

Required readings are indicated with a star (\*). The coverage of some topics will be determined in class.

### 1. Optimization with one independent variable

#### 1.1. Derivatives and differentiation

\*Textbook chapter 6

#### 1.2. Applications of derivatives

\*Textbook chapter 7

#### 1.3. Economic applications of functions and derivatives

\*Textbook chapter 8

#### 1.4. Elasticity

\*Textbook chapter 9

#### 1.5. Derivatives of exponential and logarithmic functions and their applications

\*Textbook chapter 13

### 2. Optimization with two or more independent variables

#### 2.1. Functions of two or more independent variables

\*Textbook chapter 14

#### 2.2. Maximum and minimum values, the total differential and applications

\*Textbook chapter 15

#### 2.3. Constrained maximum and minimum and applications

\*Textbook chapter 16

#### 2.4. Returns to scale and homogeneous functions

\*Textbook chapter 17

**Course Evaluation:**

The basis for determining your final grade in this course is as follows:

2 Assignments: 20% (10% each)

2 Mid-term exams: 40% (20% each) Tentative dates to be confirmed Wednesday October 12, 2022 and Wednesday November 16, 2022.

Final exam formally scheduled during the final examination period: 40%.

Assignments will consist of solving problems.

All exams will be based on solving problems.

The midterms and the final are closed book examinations.

The final exam is comprehensive (it will cover the whole material unless specified otherwise).

Students who miss a midterm or an assignment for a valid reason (illness, family emergency, etc.. documented appropriately) will have the associated weight added to that of the final exam. Should the final exam be missed for any reason, a grade of F will be assigned, and the student must arrange for the possibility of a deferred examination through the Registrar's Office within 3 working days of the exam. If granted by the Registrar's Office, this exam will take place during the time designated in the Calendar. Special final exams (or mid-terms) will not be given.

Standing in a course is determined by the course instructor subject to the approval of the Faculty Dean. This means that grades submitted by the instructor may be subject to revision. No grades are final until they have been approved by the Dean. Application to write a deferred final examination must be made at the Registrar's Office.

**Practice Problems:**

Students are encouraged to work through as many textbook problems as possible, since this is the best way to learn the course material and prepare for exams.

**Tutorials:**

There will be tutorials conducted by the TA to go over solutions to exams and assignments as well as of some practice problems. Details will be provided later.

**Brightspace and e-mail:**

**This course will make use of Brightspace.**

Lecture notes, review questions, problems, references to additional readings and any other material will be posted on Brightspace. Class announcements will be sent by e-mail using Brightspace.

**It is each student's responsibility to check this website for posted material as well as the Carleton University email system for correspondence.** If you do not have a Brightspace account, visit <https://carleton.ca/brightspace/>

### **Re-marking:**

Any request for the remarking of exams or assignments must be submitted in writing within two weeks of that assignment or exam first being returned to the class. The request should contain a detailed explanation of why you feel you should receive a higher mark. Please note that remarking will apply to the entire assignment or exam, and not just to the contentious question. As a result, the revised mark may be higher than, lower than or the same as the original mark.

### **Plagiarism:**

Please be aware that plagiarism is a serious offence at Carleton University.

The University Academic Integrity Policy defines plagiarism as “presenting, whether intentionally or not, the ideas, expression of ideas or work of others as one’s own.” This includes reproducing or paraphrasing portions of someone else’s published or unpublished material, regardless of the source, and presenting these as one’s own without proper citation or reference to the original source. Examples of sources from which the ideas, expressions of ideas or works of others may be drawn from include but are not limited to: books, articles, papers, literary compositions and phrases, performance compositions, chemical compounds, artworks, laboratory reports, research results, calculations and the results of calculations, diagrams, constructions, computer reports, computer code/software, material on the internet and/or conversations.

Examples of plagiarism include, but are not limited to:

- any submission prepared in whole or in part, by someone else;
- using ideas or direct, verbatim quotations, paraphrased material, algorithms, formulae, scientific or mathematical concepts, or ideas without appropriate acknowledgment in any academic assignment;
- using another’s data or research findings without appropriate acknowledgement;
- submitting a computer program developed in whole or in part by someone else, with or without modifications, as one’s own; and
- failing to acknowledge sources through the use of proper citations when using another’s work and/or failing to use quotations marks.

Plagiarism is a serious offence that cannot be resolved directly by the course’s instructor. The Associate Dean of the Faculty conducts a rigorous investigation, including an interview with the student, when an instructor suspects a piece of work has been plagiarized. Penalties are not trivial. They can include a final grade of “F” for the course. For more information, see the [University Academic Integrity](#) page.

### **Intellectual Property Rights Regarding Course Material:**

Please note: “Classroom teaching and learning activities, including lectures, discussions, presentations, etc., by both instructors and students, are copy 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).” (See <https://carleton.ca/provost/2015/calendar-dates-and-course-materials-sharing-website/>)

**Requests for Academic Accommodation:**

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: [carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf](http://carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf)

**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: [carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf](http://carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf)

**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](mailto: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 [carleton.ca/pmc](http://carleton.ca/pmc)

**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 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](http://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. For more details, see [the policy](#).