

ECON 3001 B – Mathematical Methods of Economics

Winter 2023

Department of Economics

Carleton University

Instructor: Ahmad Malgarai

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IN-PERSON - MEETING TIMES:

Lectures: Wednesdays and Fridays, 1135-1255 HRS (PM), Building: Southam Hall Room 304

Tutorial: Friday, 1305-1425 HRS (PM), Building: Southam Hall Room 304

Office hours: Wednesday, 0935-1055 HRS (AM), Loeb D881.

Website: Accessible at <https://brightspace.carleton.ca>

TA: TBA

GENERAL COURSE OBJECTIVES:

This course is designed to provide students with knowledge of some of the basic mathematical tools used in economic theory. Topics include Concave and convex functions, homogeneous and homothetic 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.

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://brightspace.carleton.ca>.

Supplementary textbook: *Further Mathematics for Economic Analysis (2nd edition)* by Knut Sydsaeter, Peter Hammond, Atle Seierstad, Arne Strom Prentice Hall, 2008

ASSESSMENT METHODS

Marks are based on two assignments one midterm exam and one final exam (all exams are cumulative). Tentative dates for midterm exams are October 19th and November 23rd, in class, and the final examination will be

- First Assignment: 5% (will be posted on February 01 – due date: February 17)
- One in-class midterm exam: 30% on February 22 (will be held during the lecture time)
- Second Assignment: 5% (will be posted on April 05 – due date: April 19)
- Final Examination: 50% (Will be in-person examination. The final examination will be scheduled by the University)
- Class participation will have a weight of 5% of the final course grade.
- Tutorial attendance will have a weight of 5% of the final course grade.

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. Should the final exam be missed for any reason, a grade of 0 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 will not be given.

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.

Brightspace and the Carleton email system will be used extensively as a means of communication with students. Therefore, students are strongly advised to access Brightspace and check their Carleton email at regular intervals in order to check for new information. To access Brightspace and the Carleton email system, students require a MyCarletonOne account. For questions about MyCarletonOne accounts, students should access <http://carleton.ca/ccs/get-started/> (and then click on either New Students or New Grad Students, as appropriate) or contact the ITS Service Desk (4th Floor, MacOdrum Library, telephone: 613-520-3700).

TUTORIALS

Weekly tutorials will be conducted. The TA will show the students the applications of concepts and theories presented in classes step by step by using some examples.

ASSIGNMENTS

1: There are tutorials for one hour per week. The TA will present more examples related to the class materials and the assignments, and the students will pick up their marked assignments at that time.

2: Students are encouraged to work through as many textbook problems as possible since these are the best way to learn the course and prepare for the exams as well. Students may wish to

work together on assignments, BUT each student MUST write up his/her assignments independently.

3: Late submissions will NOT be accepted for any assignment. I realize that everyone has a life outside of academics and that sometimes circumstances out of your control can severely impede your ability to complete your work on time. If you find yourself in this position, please inform me as soon as possible. If you are able to contact me before the assignment is due, there will be more opportunities for flexibility. I am usually very flexible in granting accommodations before an assignment is due. I am never flexible in accepting work, or excuses after the due date have passed.

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).

STATEMENT ON MENTAL HEALTH

As a University student, you may experience a range of mental health challenges that significantly impact your academic success and overall well-being. If you need help, please speak to someone. There are numerous resources available both on- and off-campus to support you. Here is a list that may be helpful: Emergency Resources:

- <https://carleton.ca/health/emergencies-and-crisis/emergency-numbers/>
- Carleton Resources:
- Mental Health and Wellbeing: <https://carleton.ca/wellness/>
- Health & Counselling Services: <https://carleton.ca/health/>
- Paul Menton Centre: <https://carleton.ca/pmc/>
- Academic Advising Centre (AAC): <https://carleton.ca/academicadvising/>
- Centre for Student Academic Support (CSAS): <https://carleton.ca/csas/>

- Equity & Inclusivity Communities: <https://carleton.ca/equity/> Off Campus Resources:
- Distress Centre of Ottawa and Region: (613) 238-3311 or TEXT: 343-306-5550, <https://www.dcottawa.on.ca/>
- Mental Health Crisis Service: (613) 722-6914, 1-866-996-0991, <http://www.crisisline.ca/>
- Empower Me: 1-844-741-6389, <https://students.carleton.ca/services/empower-me-counsellingservices/> ^ Good2Talk: 1-866-925-5454, <https://good2talk.ca/>
- The Walk-In Counselling Clinic: <https://walkincounselling.com>

STATEMENT ON PANDEMIC MEASURES:

It is important to remember that COVID is still present in Ottawa. The situation can change at any time and the risks of new variants and outbreaks are very real. There are a number of actions you can take to lower your risk and the risk you pose to those around you including being vaccinated, wearing a mask, staying home when you're sick, washing your hands and maintaining proper respiratory and cough etiquette.

Feeling sick? Remaining vigilant and not attending work or school when sick or with symptoms is critically important. If you feel ill or exhibit COVID-19 symptoms do not come to class or campus. If you feel ill or exhibit symptoms while on campus or in class, please leave campus immediately. In all situations, you should follow Carleton's symptom reporting protocols.

Masks: Masks are no longer mandatory in university buildings and facilities. However, we continue to recommend masking when indoors, particularly if physical distancing cannot be maintained. We are aware that personal preferences regarding optional mask use will vary greatly, and we ask that we all show consideration and care for each other during this transition.

Vaccines: While proof of vaccination is no longer required to access campus or participate in in-person Carleton activities, it may become necessary for the University to bring back proof of vaccination requirements on short notice if the situation and public health advice change. Students are strongly encouraged to get a full course of vaccination, including booster doses as soon as they are eligible and submit their booster dose information in cuScreen as soon as possible. Please note that Carleton cannot guarantee that it will be able to offer virtual or hybrid learning options for those who are unable to attend the campus.

All members of the Carleton community are required to follow requirements and guidelines regarding health and safety which may change from time to time. For the most recent information 54 about Carleton's COVID-19 response and health and safety requirements please

see the University's COVID-19 website and review the Frequently Asked Questions (FAQs). Should you have additional questions after reviewing, please contact covidinfo@carleton.ca.

Plagiarism: Please be aware that plagiarism is a serious offence at Carleton and should be recognized and avoided. For further information on how to do so, please see “[Academic Integrity and Offenses of Conduct](http://www.carleton.ca/economics/courses/writing-preliminaries)” at www.carleton.ca/economics/courses/writing-preliminaries

ACCOMMODATION STATEMENTS

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

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

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. carleton.ca/pmc