GORDON S. LANG SCHOOL of BUSINESS AND ECONOMICS

ECON*2770
Introductory Mathematical Economics
Fall 2024 (0.5 Credits)

General Course Information

Instructor:	Jiangnan Zeng
Email	jiangnan@uoguelph.ca
Office Location	743 McKn
Office Hours	Wed&Fri: 9:30-10:30 am (other time by appointment via email)
Department/School	Department of Economics and Finance
Class Schedule:	Mon, Wed, Fri: 2:30 pm - 3:20 pm (ROZH 102 LEC) for section 01
	Mon, Wed, Fri: 11:30 am - 12:20 pm (ROZH 102 LEC) for section 02
Pre-requisites:	Prerequisite(s): ECON*1100, (ECON*1050, or FARE*1040), (1 of MATH*1030, MATH*1080, MATH*1200)

Course Description

This course applies the elements of calculus and matrix algebra to simple microeconomic and macroeconomic problems.

Course Learning Outcomes

Upon successfully completing this course, you will have:

Skills:

1) Written Communication
Many questions posed in lectures, midterms, quizzes and practice assignments require economic interpretation of the answers. Students obtain significant experience in developing logical statements about the economic (and mathematical) models and their results.
2) Analytical Problem Solving
The main emphasis of this course is the learning of mathematical tools and their relationship to economic analysis. Students obtain extensive experience in lectures, midterms, quizzes and practice assignments developing their ability to solve problems analytically.
3) Numerical Problem Solving
This course is designed to teach mathematical tools and their relationship to economic analysis. Students obtain extensive experience in lectures, midterms, quizzes and practice assignments developing their ability to solve problems numerically. These are typically done as examples of more general mathematical models. See point 2) above.

Discipline/Professional and Transferable Skills:

Economic modelling (particularly microeconomic), such as analysis of firms in specific markets (e.g., perfect competition, monopoly, oligopoly), or effects of economic policy and government intervention on decision making, and general mathematical methodology for economics.

Attitudes and Values

Students will come to understand that Mathematics is a useful too that gives us so much insight into economics and commerce.

Summary of Course Content and Materials

- Review (little economics, mostly math background): student's responsibility
  1) Basic arithmetic and algebra: Hoy, et al., Ch 1 (pp. 3 -10)
  2) Sets, subsets, functions: Hoy, et al., Ch 2.1 - 2.4 (pp. 11 - 60)
  3) Continuity of functions of one variable with economic applications: Hoy, et al., Ch 4 (pp. 100-126)

- Regular course material (more economic examples and applications):
  4) Sequences and limits: Hoy, et al., Ch 3 (pp. 61-99)
  5) Derivatives and differential for functions of one variable: Hoy, et al., Ch 5
  6) Unconstrained optimization of functions of one variable: Hoy, et al., Ch 6 (excluding pp. 217 - 219)
  7) Systems of linear equations: Hoy, et al., Ch 7
  8) Matrices: Hoy, et al., Ch 8
  9) Determinants and the inverse matrix: Hoy, et al., Ch 9
  10) Calculus for functions of n-variables: Hoy, et al., Ch 11.1 - 11.5 (excluding elasticity of substitution pp. 461-463)
  11) Optimization of functions of n-variables: Hoy, et al., Ch 12
  12) Constrained optimization: Hoy, et al., Ch 13 (omit Dual pp. 513 - 514) but include Interpretation of Lagrange multiplier (λ)

Course Assessment

			Associated Learning Outcomes	Due Date/ location
Assessment 1:	10%	Quizzes (online)	LO 1-5	On Courselink, due at **11:59pm**
Assessment 2:	20%	10 weekly Mobius	LO 1-5	On Courselink, due at **11:59pm**

		assignments (best 5 of 6)		
Assessment 3:	30%	Midterm Exam	LO 1-5	October 18, 2024 6:00-9:00 pm Room: Rozanski Hall
Assessment 4:	40%	Final	LO 1-5	Wed 8:30 AM - 10:30 AM 12/4/2024
Total	100			
Bonus assessment	5%	in class short assignments	LO 1-5	In class; occasionally

Teaching and Learning Practices

Office hours

Office hours will be in person, but if the situation necessitates, they could also be conducted by zoom, but they will not be recorded.

Course requirements

A large part of the work that you will do in this course will be using Mobius. If you are not familiar with this testing and assessment program, it will be very important that you begin to read all the documents that I post about Mobius; ask questions during office hours, if you are not clear on how Mobius works;

be sure to stay up to date on assignments.

Communication and Office Hours

All course announcements will be sent out via email and be posted on Courselink. It is your responsibility to check your email for announcements.

If you have a question about the course in general, or about the course material, please post it on the online discussion board. Indicate the theme of the question (or the question itself, if short) in the subject line. If you have a question, it is likely that other students wonder about this, too. If you post the question, everyone can see the answer. I will answer to a posted question within 24-48 hours and during standard working times and days. If you know the answer to a posted question, do not hesitate to answer it before I do. This will be very helpful to your fellow students.

If you have a personal questions or concerns, please email me, please directly email me. DO NOT message me on Courselink, as I will never see your message and you will get no response. You can expect replies within 24 hours during the workweek (Monday-Friday, 9am-5pm). DO NOT expect an immediate reply if you email me on a weekend or between 5pm and 9am, even if I have previously responded to an email during those times. If you do not receive a response within 24 hours, assume that I missed your email and send a follow-up. Please use personal and professional courtesy in your emails.

If you have a time conflict with my office hours, please email me and we can see if we can set up an appointment and a different time.

Course Resources

Required Text: Mathematics for Economics, 3rd edition, Hoy, Livernois, McKenna, Rees, and Stengos, MIT Press, 2011. – referred to as Hoy, et al. in this course outline

Website for MIT Press:

[Mathematics for Economics, Third Edition | The MIT Press](#)

Note: Several copies will be placed on reserve in the library. You may also buy a used textbook.

Recommended Text: Student's Solutions Manual (e-book, not required, only recommended),

3rd edition, Hoy, Livernois, McKenna, Rees, and Stengos, MIT Press, 2011

Website for MIT Press:

[Student Solutions Manual for Mathematics for Economics, Third Edition | The MIT Press](#)

Course Website: The course website is on courselink. Most importantly, the quizzes will be done through courselink. On the website, you will also find all necessary information regarding the course, as well as all announcements made throughout the course and additional online materials (such as solutions to midterm exams). Grades will be posted there as well. The online discussion board for students provides a valuable means of communications between you and your classmates.
Students are required to visit the course website regularly: Announcements will only be posted there and not sent by email. Students are expected to be aware of all announcements made on the website.

Other Resources: Assignments are done using the software program Möbius. There is an annual subscription fee for this software which will cover its use for this course and any other course over this academic year that also uses Möbius. This will be explained fully on the first day of classes and through an email to you before then.

Course Policies

Lectures
Please make sure you always attend the lecture you are registered for. It cannot be guaranteed that lectures in different sections will cover materials at the same time.

Online Quizzes
Please refer to detailed and important instructions below.

Extra Credit Opportunities

There will be extra credit assignments throughout the course. They will be announced in class and on courselink. Extra credit assignments will be handwritten and have to be submitted in person (not by email).

Grading Policies

Unless you have discussed an extension well ahead of the due date with the instructor, late penalties of **5%** of the total grade earned per day (including weekends) will be assigned to any assessment (i.e. deducted from the total mark). Extensions will only be granted on the basis of valid medical or personal reasons, and need to be requested via email to the instructor as soon as possible. Late assignments will not be accepted once graded assignments have been returned officially to the class at large, unless circumstances permit and alternative arrangements have been made.

Students who find themselves unable to meet course requirements by the deadlines or the criteria expected because of medical or personal reasons, should review the regulations on academic consideration in the Academic Calendar and discuss their situation with the instructor, program counselor or other academic counselor as appropriate.

Missed Assignments: A grade of zero will be assigned if you fail to submit an assignment, unless you are ill or have other compassionate reasons. Please read your Undergraduate Calendar for the regulations regarding illness and compassionate grounds. Please note, vacation travel, moving house, or outside work commitments will not be accepted as valid reasons for missing deadlines.

Missed Exams and Time Conflicts

Students with time conflicts with the final exam cannot register for this course. If the final exam is missed, the course is not completed.

If you have a documented medical or compassionate reason for missing a midterm, you will have an opportunity to write a make-up exam at a given date and time (there will be only one make-up per midterm), or you may choose to transfer the weight to the final exam. If you fail to write the make-up exam, the weight of the midterm will be transferred to the final exam. If you miss a midterm without a legitimate excuse, your grade for the midterm will be 0%.

It is the student's responsibility to inform the instructor of a time conflict with a midterm exam within the first two weeks of the course and to discuss how this time conflict will be handled. After this period, it is in the instructor's discretion to decide how the time conflict will be handled. Students who find themselves unable to meet course requirements by the deadlines or the criteria expected because of medical or personal reasons, should review the regulations on academic consideration in the Academic Calendar and discuss their situation with the instructor, program counselor or other academic counselor as appropriate. http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-grds.shtml

If you have religious observances which conflict with the course schedule or if you are registered with Student Accessibility Services, please contact the course instructor in order to make arrangements for your assessment if appropriate.

Electronic Devices and Recording of Lectures

Electronic recording of classes is expressly forbidden without consent of the instructor. When recordings are permitted they are solely for the use of the authorized student and may not be reproduced, or transmitted to others, without the express written consent of the instructor.

University Policies

Academic Consideration

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons, please advise the course instructor in writing, with your name, id#, and e-mail contact. See the academic calendar for information on regulations and procedures for Academic Consideration:

https://www.uoguelph.ca/registrar/calendars/graduate/current/

Academic Misconduct

The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community, faculty, staff, and students to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring.

University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection. Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

The Academic Misconduct Policy is detailed in the Graduate Calendar:

https://calendar.uoguelph.ca/graduate-calendar/general-regulations/academic-misconduct/

Accessibility

The University of Guelph is committed to creating a barrier-free environment. Providing services for students is a shared responsibility among students, faculty and administrators. This relationship is based on respect of individual rights, the dignity of the individual and the University community's shared commitment to an open and supportive learning environment. Students requiring service or accommodation, whether due to an identified, ongoing disability or a short-term disability should contact Student Accessibility Services as soon as possible.

For more information, contact SAS at 519-824-4120 ext. 56208 or email sas@uoguelph.ca or see the website: https://wellness.uoguelph.ca/accessibility/

Course Evaluation Information

Please refer to the Blue by Explorance system.

Recording of Materials

Presentations which are made in relation to course work—including lectures—cannot be recorded or copied without the permission of the presenter, whether the instructor, a classmate or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

Drop date

The last date to drop one-semester courses, without academic penalty, is **Friday November 29, 2024.** For regulations and procedures for Dropping Courses, see the Academic Calendar:

Equity, Diversity, and Inclusion Statement

At the Lang School of Business and Economics, we are committed to developing leaders with a social conscience, an environmental sensibility, and a commitment to their communities. A core tenet within this vision is that diversity is a strength with which we can experience greater connection and understanding.

As such, we affirm the importance and shared responsibility of our students, faculty, and staff creating and promoting equity and inclusion within our learning spaces. Creating these kinds of learning cultures is a process, not a destination; it requires ongoing willingness on the part of each person to thoughtfully and critically listen, unlearn, learn, and engage as they are exposed to a multitude of perspectives and lived experiences. We encourage dialogues between students and instructors to address and advance opportunities for fostering greater diversity and inclusion in the learning environment. Openness to conversations with each other enables us to reflect and grow as we learn from one another respectfully and holistically.

As a department that is training the professionals of the future, we expect our learning spaces to abide by all institutional policies and guidelines, in particular those outlined by the Office of Diversity and Human Rights and the University of Guelph Human Rights Policy. Discrimination and harassment, as defined by our policies, will not be tolerated. Individuals should inform the appropriate party as per University policies if they experience any such behaviours.

Online Quizzes – Detailed Instructions

In a week with a quiz (for dates refer to the detailed class schedule on courselink):

1) Start the quiz any time between Friday 9am and Sunday midnight.
2) There is only one attempt per quiz. Once you submit your quiz, your answers are final. As long as you don't submit your quiz, you can keep changing your answers.

3) You have until exactly Sunday 9pm to submit your quiz **independent of what the program tells you. By default, it indicates 'unlimited time'. This is not the case.** Access to the quiz expires on Sunday at 9pm. **Please disregard the clock/timer! I will not accept any excuses regarding a misunderstanding of the clock/timer or time allowed indicated by the program!**

Please note also: For technical reasons, I can under no circumstances extend the availability of the quiz for individual students beyond Sunday 9pm. **It is the student's responsibility to make sure that the quiz is started and completed on time. Make sure ahead of time that your computer and the access to courselink work properly. It is not at all possible to extend due dates/times for individual students (technical reasons).**

Quiz questions will be drawn randomly from a pool of questions, so that it is not likely that two students will have the same quiz. The level of difficulty of each question and the number of questions per quiz will be the same for every student. No student's quiz will be easier or more difficult than another student's quiz.

4) Once you submit the quiz your answers are fixed. I will not be able to re-open the quiz for you. Please submit the quiz only if you are completely sure of your answer.

5) Please note that you don't have to complete the quiz in one sitting. You can work on some questions, log out, and later log back in to continue working.

6) Once you submit your quiz, you will be able to see the number of points you got. Since other students may still be working on the quiz, you will not be able to see correct solutions and feedback until Monday morning after the quiz. If you log back in on Monday (or any other time after), you can see your answer, the correct answer, and feedback.