

Introductory Mathematical Economics II

ECON 1540
Department of Economics
Winter Term 2025

Course Information

Course Instructor: Barry Smith
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Office Hours: MW 10:15-11:15
Online Meetings TBA

Course website: eClass/Moodle

Course Description

This course extends the analysis of basic economics ideas, topics and problems begun in ECON 1530. Again, relevant mathematical ideas and techniques are recalled and/or derived so as to provide a deeper understanding of economic issues and how they can be resolved.

The issues and problems covered require functions of more than one variable for their resolution. We begin with an introduction to matrix algebra which allows us to manipulate collections of functions and variables. The notion of quantity supplied is combined with the notion of quantity demanded and notions of market equilibrium are introduced and discussed. Equilibria are evaluated through the introduction of mathematical notions and properties of systems of equations. A deeper understanding of theories of demand (supply) and the foundations of demand (supply) functions is developed through the introduction of mathematical notions of unconstrained and constrained optimization and linear and nonlinear programming. As in ECON 1530, many topics and issues are addressed and problem framing and problem-solving abilities are enhanced.

Prerequisite: AP/ECON 1530 3.00 or equivalent.

Prerequisites/Co-requisites: AP/ECON 1000 3.00 or AP/ECON 1010 3.00, or equivalent. Note: No credit will be retained for this course for students who have successfully completed or who are currently enrolled in SC/MATH 1021 3.00, SC/MATH 1025 3.00, or SC/MATH 2221 3.00.

Course credit exclusions: SC/MATH 1505 6.00, SC/MATH 1540 3.00, SC/MATH 1550 6.00, GL/MATH/MODR 2650 3.00. Note: Acceptable course substitutes are available in the Calendar.

Course Learning Objectives

By the end of this course, students should have a solid knowledge of matrix algebra and multivariate calculus and be able to set up and solve unconstrained and constrained optimization problems with particular emphasis on economic problems.

- a. Matrix and vector algebra, determinants and inverse matrices, linear programming
- b. Functions of many variables, tools for comparative statics, multivariable optimization
- c. Constrained optimization

Technical Requirements

eClass will be used for posting class materials and making announcements. We also may be using Zoom at some point in the term through which students will interact with the course materials, the course director, as well as with one another.

Course Communication Plan and Office Hours

My office is VH 1032. Office hours may be done on-line. I encourage students who wish to see me, but who cannot physically attend office hours, to arrange an in-person or on-line meeting with me. Regularly check the eClass page for announcements.

Course Evaluation

The final mark will be based on three midterm tests (tentatively scheduled for **Saturday, Feb 1, Saturday, March 1, Saturday, March 22, all at 10:00, room TBA**) which will contribute to 40% of Final Grade based on best 2/3 midterm marks and a final exam (Date TBA, 60% of Final Grade). In the unlikely event that the university substantially changes its current policies regarding public health measures, these proportions may be changed.

Missed Tests and Exams

There are no makeups for missed midterm tests for any reasons. Note that the best 2/3 mid-term test grades will contribute to the final grade. Anyone missing a midterm test will receive zero for that test. There will be no deferments offered for missed final exams except under very unusual circumstances. Anyone wishing to write a deferred final exam generally will be required to formally petition for such. Students should provide official documentation for missing an exam. Final course grades may be adjusted to conform to Program or Faculty grades distribution profiles.

Required Course Materials *Essential Mathematics for Economic Analysis*, sixth edition, Knut Sydsæter, Peter Hammond, Arne Strom, Andrés Carvajal, Pearson.

Students are strongly advised to obtain a hardcopy version of the textbook, available at the bookstore or on-line. (Recent price at Amazon was quite low.) There is a virtual version of the text available with a link provided on the course eClass page. A hardcopy version of the text will become a valuable reference in upper level courses.

Students may only use non-programmable calculators during tests or midterms. (E.g. if a calculator can compute derivatives or integrals, it is not permitted.) If you are not certain if it is allowed, ask me before the test or exam. Cheap calculators available at a dollar store are usually quite adequate.

Assignments

Assignments will be distributed on a regular basis.

Class Attendance

Class attendance and participation is mandatory. Students are required to close any electronic devices apart from calculators and, say, one reader which may be used to mark up class notes. You should actively participate in class. Materials particularly germane to the midterms and final exam will often be covered exclusively in class. All tests and exams are based on all material covered up to and including the material covered in the class prior to the test/exam. It is your responsibility to be informed of what is covered in class.

Tutorials and Labs

The Department of Economics will be running Peer Assisted Study Sessions (PASS). Students may also receive assistance at the Student Numeracy Assistance Centre at Keele (SNACK).

Using Zoom

Students shall note the following:

- Zoom is hosted on servers in the United States and Canada. Recordings made since May 1, 2022 are stored in Canada. For more information, please refer to the notes on [Zoom Privacy and Security](#) provided by Information Security at York.
- If you have privacy concerns about your data, provide only your first name or a nickname when you join a session.
- The system is configured in a way that all participants are automatically notified when a session is being recorded. In other words, a session cannot be recorded without you knowing about it.

Here are some useful links for student computing information, resources, and help:

- [Student Guide to eClass](#)
- [Zoom@YorkU Best Practices](#)
- [Zoom@YorkU User Reference Guide](#)
- [University Information Technology \(UIT\) Student Services](#)
- [Student Guide to eLearning at York University](#)

To determine Internet connection and speed, there are online tests, such as [Speedtest](#), that can be run. If you need technical assistance, please consult the [University Information Technology \(UIT\) Student Services](#) web page. For more specific assistance, please write to askit@yorku.ca.

Course Policies

All students are expected to familiarize themselves with the following information:

- [Student Rights & Responsibilities](#)
- [Academic Accommodation for Students with Disabilities](#)

Please also review the following course policies:

Academic Integrity

Academic integrity is a fundamental and important value of York University. To maintain a fair and honest learning environment, students in this course are responsible for understanding and upholding academic integrity in all of their academic activities. To better understand expectations, familiarize yourself with the Senate Policy on Academic Conduct. To learn more about how to demonstrate academic integrity in your courses and to access related resources and support, visit the [Academic Integrity website](#).

Accessibility

While all individuals are expected to satisfy the requirements of their program of study and to aspire to achieve excellence, the University recognizes that persons with disabilities may require reasonable accommodation to enable them to perform at their best. The University encourages students with disabilities to register with [Student Accessibility Services](#) to discuss their accommodation needs as early as possible in the term to establish the recommended academic accommodations that will be communicated to Course Directors through their Letter of Accommodation (LOA).

Please let your instructor know as early as possible in the term if you anticipate requiring academic accommodation so that we can discuss how to consider your accommodation needs within the context of this course. Sufficient notice is needed so that reasonable steps for accommodation can be discussed. Accommodations for tests/exams normally require three (3) weeks (or 21 days) before the scheduled test/exam to arrange.

Religious Observance Accommodation

York University is committed to respecting the religious beliefs and practices of all members of the community, and making reasonable and appropriate [accommodations to adherents for observances of special significance](#). Should any of the dates specified in this syllabus for course examinations, tests, or deadlines conflict with a date of religious significance, please contact the instructor within the first three (3) weeks of class. If the date falls within the formal examination periods, you must complete and submit a [Religious Accommodation for Examination Form](#) at least three (3) weeks before the start of the exam period.

Intellectual Property

Course materials are designed for use as part of this particular course at York University and are the intellectual property of the instructor unless otherwise stated. Third-party copyrighted materials (such as book chapters, journal articles, music, videos, etc.) have either been licensed for use in this course or fall under an exception or limitation in Canadian copyright law. Students may not publish, post on an Internet site, sell, or otherwise distribute any course materials or work without the instructor's express permission. Course materials should only be used by students enrolled in this course.

Copying this material for distribution (e.g., uploading material to a commercial third-party website) may lead to a charge of misconduct according to York's [Code of Student Rights and Responsibilities](#), the [Senate Policy on Academic Honesty](#), and/or legal consequences for copyright violations.

Student Conduct in the Learning Environment

York University is committed to fostering teaching and learning environments that are free of disruptive and/or harassing behaviour, are physically safe, and conducive to effective teaching and learning. Students and instructors are expected to maintain a professional relationship characterized by courtesy, civility, and mutual respect and to refrain from actions disruptive to such a relationship. Individuals who fail to adhere to such standards and who violate University or public law may be subject to disciplinary action by the University.

For more information, see the policies on [Disruptive and/or Harassing Behaviour in Academic Situations](#), the [Student Conduct and Responsibilities](#), and the [Code of Student Rights & Responsibilities](#).

Netiquette for eClass and Online Learning

Students and instructors have a joint responsibility to create and maintain a welcoming and inclusive learning environment. All students are expected to conduct themselves in accordance with the [Code of Student Rights and Responsibilities](#). Please review and familiarize yourself with behaviours that support "netiquette" in virtual classrooms by consulting the [Guide to Netiquette](#) and [Student Guide to eLearning](#).

Student Notice of Recording for Online Teaching and Learning

Activities for this course involve recording, in partial fulfillment of the course learning outcomes. Images, audio, text/chat messaging that have been recorded may be used and/or made available by the University to students enrolled in the course and those supporting the course for the purpose of materials review, for assessment, etc. Recordings will be managed according to the University's Common Record Schedule and will be securely destroyed when no longer needed by the University. Your personal information is protected in accordance with York University's [Guidelines on Access of Information and Protection of Privacy](#) and the [Freedom of Information and Protection of Privacy Act](#). Access to online materials, including recordings or live meetings, is subject to York University's [Senate Policy on Computing and Information Technology Facilities](#).

The University will use reasonable means to protect the security and confidentiality of the recorded information, but cannot provide a guarantee of such due to factors beyond the University's control, such as recordings being forwarded, copied, intercepted, circulated, disclosed, or stored without the University's knowledge or permission, or the introduction of malware into computer system which could potentially damage or disrupt the computer, networks, and security settings. The University is not responsible for connectivity/technical difficulties or loss of data associated with your hardware, software, or Internet connection.

By engaging in course activities that involve recording, you are consenting to the use of your appearance, image, text/chat messaging, and voice and/or likeness in the manner and under the conditions specified herein. In the case of a live stream recording, if you choose not to have your image or audio recorded, you may disable the audio and video functionality. If you choose to participate using a pseudonym instead of your real name, you must disclose the pseudonym to your instructor in advance to facilitate class participation.

You are not permitted to disclose the link to/URL of an event or an event session recording or copies of recording to anyone, for any reason. Recordings are available only to authorized individuals who have been directly provided the above instructions/link for their use. Recordings for personal use, required to facilitate your learning and preparation of personal course/lecture notes, may not be shared with others without the permission of the instructor or event coordinator, and may not be published, posted, linked to, or otherwise made available online, including on social media feeds, even if those feeds are private.

Health and Safety

All York students and instructors share responsibility for the safety and well-being of the community while on York's campuses. Please continue to check [YUBetter Together](#) for the latest information on health and safety.

Student Support and Resources

To help you succeed academically, York University offers a wide range of resources and services. Everything from writing workshops and peer mentorship to wellness support and career guidance is available to fulfill our LA&PS students' needs. Explore the links below to access these on-campus resources:

- [Academic Advising](#) is available to provide students support and guidance in making academic decisions and goals.
- [Student Accessibility Services](#) are available for support and accessibility accommodation when required.
- [Student Counselling, Health & Wellbeing](#) offers workshops, resources, and counselling to support your academic success.
- [Peer-Assisted Study Sessions \(PASS\) Program](#) provides student study sessions for students to collaborate and enhance their understanding of course content in certain courses.
- [Student Numeracy Assistance Centre at Keele \(SNACK\)](#) supports students in courses involving math, stats, and Excel.
- [The Writing Centre](#) provides multiple avenues of writing-based support including drop-in sessions, one-to-one appointments, a Multilingual Studio, and an Accessibility Specialist.
- [ESL Open Learning Centre \(OLC\)](#) supports students with building proficiency in reading, writing, and speaking English.
- [Learning Skills Services](#) provides tips for time management, effective study and learning habits, keeping up with coursework, and other learning-related supports.
- [Learning Commons](#) provides links to supports for time management, writing, study skills, preparing for exams, and other learning-related resources.
- [Roadmap to Student Success](#) provides students with timely and targeted resources to help them achieve academic, personal, and professional success.
- [Office of Student Community Relations \(OSCR\)](#) is responsible for administering the [Code of Student Rights & Responsibilities](#) and provides critical incident support.
- [goSAFE](#) is staffed by York students and can accompany York community members to and from any on-campus location, such as the Village Shuttle pick-up hub, parking lots, bus stops, or residences.

For a full list of academic, wellness, and campus resources visit [Student Support & Resources](#).