

## Introductory Mathematical Economics II

AP/ECON 1540B

FALL 2026

### COURSE INFORMATION

Course Instructor: David K. Lee, Ph. D.

E-mail: [dklee@yorku.ca](mailto:dklee@yorku.ca)

Phone:

Course Time & Days: W/M 11:30am -12:50pm

Class Location: CLH C

Course eClass site:

### Course Communication Plan and Office Hours

My office is VH 1129. Office hours may be done on-line. I encourage students who wish to see me can arrange an in-person or on-line meeting with me. Regularly check the eClass page for announcements. Zoom connection information will be available through eclass.

**Online Tutorial Session:** The tutorial session will be held online via Zoom by the course instructor. It will be held on Saturday evenings from 8:00 PM to 9:00 PM. This is not an official schedule, and attendance will not be checked. However, all students are encouraged to attend this session.

### Tutorials, Labs and TA Contact Information

TBA

### Land Acknowledgment

York University recognizes that many Indigenous Nations have longstanding relationships with the territories upon which York University campuses are located that precede the establishment of York University. York University acknowledges its presence on the traditional territory of many Indigenous Nations. The area known as Tkaronto has been care taken by the Anishinabek Nation, the Haudenosaunee Confederacy, and the Huron-Wendat. It is now home to many First Nation, Inuit, and Métis communities. We acknowledge the current treaty holders, the Mississaugas of the Credit First Nation. This territory is subject of the Dish with One Spoon Wampum Belt Covenant, an agreement to peaceably share and care for the Great Lakes region ([LA&PS Land Acknowledgement](#)).

### Course Description (prerequisites/co-requisites):

This course extends the analysis of basic Economics ideas, topics and problems begun in AP/ECON 1530 3.00. 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. 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, eventually in matrix form. 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 AP/ECON 1530 3.00, many topics and issues are addressed and problem framing and problem solving abilities are enhanced.

**Prerequisite:** AP/ECON 1530 3.00 or equivalent.

**Prerequisites or corequisites:** AP/ECON 1000 3.00 or AP/ECON 1010 3.00, or equivalent. No Credit Retained (NCR) Note: 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 may not take AP/ECON 1540 3.00. AP/ECON 1520 3.00, SC/MATH 1510 6.00 and SC/MATH 1520 3.00 may not be taken by any student who has passed or is currently enrolled in another university course in mathematics or statistics including AP/ECON 1530 3.00 and AP/ECON 1540 3.00.

**Course credit exclusions:** SC/MATH 1505 6.00, SC/MATH 1540 3.00, SC/MATH 1550 6.00, GL/MATH 2650 3.00, GL/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

## Course Organization

This course involves formal lectures presented by the course instructor. The classroom technology will be used extensively, such as PowerPoint, or MS word format presentation. There will be extensive usages of the course web site. Reading assignments, practice problems, problem solving, etc., for each lecture session, tutorial sessions or TA availability, etc., will be announced on the course web site.

## Required Course Materials

### Essential Mathematics for Economic Analysis, 6th Edition

Knut Sydsæter, Peter Hammond, Arne Strøm, and Andrés Carvajal. Pearson.

Although the 7th edition is available, we will use the 6th edition because this course continues from ECON 1530 and covers the remaining material in the textbook.

The 6th edition is available at York bookstores (<https://campus.bookstore.yorku.ca/>). The digital version of the textbook costs \$102.

## Technical Requirements

eClass/Moodle 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.

## Evaluation

The grade for this course is composed of the mark received for each of the following components:

| Type of Assessment                       | Percent/Weight     | Date                       |
|------------------------------------------|--------------------|----------------------------|
| Attendance                               | 20%                |                            |
| Midterm Exam I (Classroom, 90 minutes)   | Best 2 only<br>40% | Sat Oct 3 9:00am-10:30am   |
| Midterm Exam II (Classroom, 90 minutes)  |                    | Sat Oct 31, 9:00am-10:30am |
| Midterm Exam III (Classroom, 90 minutes) |                    | Sat Nov 21, 9:00am-10:30am |
| Final Exam (Classroom, 180 minutes)      | 40%                | Dec 10-23                  |
| <b>Total</b>                             | <b>100%</b>        |                            |

**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.

**Problem sets** will be posted on the course web site throughout the semester. Some of them may be solved in class. These problems will not be graded; however, I encourage you to work through them. It will help you understand the course material and consequently increase the probability that you will do well on the course. Practice may not always make perfect, but it's a good start.

## 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).

## Missed Tests and Exams

### No Makeup Midterms Offered

There are no makeups for missed midterm exams.

Students must complete at least two of the three midterm exams to avoid being penalized on the final course evaluation.

### Requesting Deferred Final Exam

Students will be required to complete a Mach form requesting a deferred exam. For complete instructions for using the Mach form, please go to our website:

<https://www.yorku.ca/laps/econ/undergraduate-programs/academic-resources/departement-policies/deferred-standing/>

A student must submit the form within 5 business days from the final exam date.

## Grading

The grading scheme for this course conforms to the 9-point system used in undergraduate programs at York University. For a full description of the York grading system, visit the York University [Academic Calendar](#).

| Grade | Grade Point | Percent Range          | Description        |
|-------|-------------|------------------------|--------------------|
| A+    | 9           | 90-100                 | Exceptional        |
| A     | 8           | 80-89                  | Excellent          |
| B+    | 7           | 75-79                  | Very Good          |
| B     | 6           | 70-74                  | Good               |
| C+    | 5           | 65-69                  | Competent          |
| C     | 4           | 60-64                  | Fairly Competent   |
| D+    | 3           | 55-59                  | Passing            |
| D     | 2           | 50-54                  | Marginally Passing |
| E     | 1           | (marginally below 50%) | Marginally Failing |
| F     | 0           | (below 50%)            | Failing            |

## Artificial Intelligence

Most students are probably acquainted to some degree with AI and may have used it to help them solve problems. Students are advised not to use AI, or at least to use it only as a last resort to check their assignment results. There are (at least) three good reasons for this, First, AI frequently makes mistakes and can give you wrong answers to questions you submit to it. Second, you will not have AI to assist you on your tests and final exam, so it is better to learn how to solve problems by yourself. Third, and most importantly, it is pedagogically unsound to use AI to solve problems. Part of the learning process involves working through problems, making mistakes and learning when you went wrong. A much better option is to work with other students on your course work and in the case of assignments, when a problem is completed, verify the right answer at the back of the textbook.

## Important Dates

Explore the York University [Academic Calendar](#) to find a list of important dates, such as class start/end dates, drop deadlines, holidays and more.

**Weekly Lecture Schedule:**

| <b>Week</b>                                                   | <b>Description</b>                                        | <b>Textbook Coverage</b> |
|---------------------------------------------------------------|-----------------------------------------------------------|--------------------------|
| <b>01</b><br><b>W Sep 9 / M Sep 14</b>                        | Topic 1:<br>Matrix Algebra – Part 1                       | Ch. 12:1-5               |
| <b>02</b><br><b>W Sep 16 / M Sep 21</b>                       | Topic 2:<br>Matrix Algebra – Part 2                       | Ch. 12:6-10              |
| <b>03</b><br><b>W Sep 23/ M Sep 28</b>                        | Topic 3:<br>Determinants and Matrix Inversion etc– Part 1 | Ch. 13:1-3               |
| <b>04</b><br><b>W Sep 30 / M Oct 5</b>                        | Topic 4:<br>Determinants and Matrix Inversion – Part 2    | Ch. 13: 4-8, 12          |
| <b>Exam 1: Sat Oct 3</b>                                      |                                                           |                          |
| <b>5</b><br><b>W Oct 7 / M Oct 19</b><br><b>RW: Oct 10-16</b> | Topic 5:<br>Functions of Several Variables – Part 1       | Ch 14:1-4                |
| <b>6</b><br><b>W Oct 21 / M Oct 26</b>                        | Topic 6:<br>Functions of Several Variables – Part 2       | Ch 14: 5-10              |
| <b>7</b><br><b>W Oct 28 / M Nov 2</b>                         | Topic 7:<br>Tools for Comparative Statics – Part 1        | Ch 15:1-7                |
| <b>Exam 2: Oct 31</b><br><b>Drop Deadline: Nov 10</b>         |                                                           |                          |
| <b>08</b><br><b>W Nov 4 / M Nov 9</b>                         | Topic 8:<br>Tools for Comparative Statics – Part 2        | Ch 15: 8-11              |
| <b>09</b><br><b>W Nov 11 /M Nov 16</b>                        | Topic 9:<br>Multivariate Optimization – Part 1            | Ch. 17: 1-3              |
| <b>10a</b><br><b>W Nov 18</b>                                 | Topic 10:<br>Multivariate Optimization – Part 2           | Ch. 17: 4-6              |
| <b>Exam 3: Nov 21</b>                                         |                                                           |                          |
| <b>10b</b><br><b>M Nov 23</b>                                 | Topic 10:<br>Multivariate Optimization – Part 2           | Ch. 17: 4-6              |
| <b>11</b><br><b>W Nov 25 / M Nov 30</b>                       | Topic 11:<br>Constrained Optimization – Part 1            | Ch. 18: 1-4              |
| <b>12</b><br><b>W Dec 2 / M Dec 7</b>                         | Topic 12:<br>Constrained Optimization – Part 2            | Ch. 18:5-6               |
| <b>Final Exam: Dec 10 - 23</b>                                |                                                           |                          |

**New Information and Changes:**

The above schedule may change slightly as the term progresses. Please check the course website for more information regarding the lecture notes, midterm tests and final exam coverage. The midterm tests cover all material from the first up to and including the class prior to the midterm. The final exam covers all course material.

**There is no excuse for not knowing course policies or schedule changes, or for not having handouts.**

## Generative Artificial Intelligence (GenAI)

Students are not permitted to use generative artificial intelligence (AI) in this course. Submitting any work created (in whole or part) through the use of generative AI tools will be considered a violation of York University's [Senate Policy on Academic Conduct](#). Using AI apps such as ChatGPT, GPT-3, DALL-E, translation software among others to complete academic work **without your instructor's knowledge or permission**, is considered to be a breach of academic honesty. For more information, please review [AI Technology & Academic Integrity: Information for Students](#).

If you're not sure whether using an AI app for your academic work is acceptable, it is recommended that you:

- Carefully review the guidelines for your assessments
- Check for any messages from your instructor on eClass
- Ask your instructor or TA if they are permitting the use of these tools

## Course Policies

Please review the course policies in this section. All students are expected to familiarize themselves with the following information:

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

## Using Zoom

Students shall note the following:

- Zoom is hosted on servers in the United States and Canada. Recordings done 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](mailto:askit@yorku.ca).

## Academic Integrity

Academic integrity is a fundamental and important value of York University. To maintain a fair and honest learning environment, you are responsible for understanding and upholding academic integrity in all courses and academic activities. You are encouraged to connect with reliable [on-campus resources](#) that support your coursework and academic honesty. To better understand the serious consequences of breaching academic honesty policies, familiarize yourself with the [Senate Policy on Academic Conduct](#). You can learn more about upholding academic integrity in your courses by exploring [Guiding Principles for LA&PS](#) and [Academic Integrity for Students](#).

## Turnitin

To promote academic integrity in this course, students will normally be required to submit their written assignments to Turnitin (via the course's eClass site) for a review of textual similarities and the detection of possible plagiarism. In so doing, students will allow their material to be included as source documents in the Turnitin.com reference database, where they will be used only for the purpose of detecting plagiarism. The terms that apply to the University's use of the Turnitin service are described on the Turnitin.com website. York students may opt out of using Turnitin. If you wish to opt out, you should contact your instructor as soon as possible.

## Accessibility

York University is committed to creating a learning environment which provides equal opportunity to all members of its community. If you anticipate or experience any barriers to learning in this course, please discuss your concerns with your instructor as early as possible. For students with disabilities, contact [Student Accessibility Services](#) to coordinate academic accommodations and services.

Accommodations will be communicated to Course Directors through a Letter of Accommodation (LOA). 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 Conduct](#), and/or legal consequences for copyright violations.

## Student Support and Resources

York University offers a wide range of student supports resources and services, including everything from writing workshops and peer mentorship to wellness support and career guidance. 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.
- [Centre for Indigenous Student Services](#) offers a community space with academic, spiritual, cultural, and physical support, including writing and learning skills programs.
- [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.
- [Peer Mentorship](#) helps students transition through their first year by connecting them with upper-year students. The mentors can help find supports and resources. They also lead a community hub on campus.
- [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](#).