York University
Faculty of Liberal Arts & Professional Studies
Department of Economics

AP/ECON 1530 A
Mathematics for Economists I
Summer 2022 Course Outline

1. Course Instructor Contact:

Instructor: Shafkat Ali
Office: VH 1057
Email: shafkata@yorku.ca
Class Location and Time: online at eclass TR 18:00-21:00
(lectures will be either prerecorded or live on zoom)

2. Course Description (prerequisites/co-requisites):

This course presents and analyzes a sequence of basic ideas, topics and problems arising in Economics. For each idea/topic/problem relevant mathematical ideas and techniques are recalled and/or derived so as to provide a deeper understanding of the Economic issue and how it can be resolved, if necessary. The notion of Quantity Demanded is first addressed by expressing quantity demanded as a linear function of price where both the slope and intercept embed important Economics ideas. This sequence leads naturally to the notion of Revenue (the product of quantity demanded and price) where nonlinear functions are analyzed using mathematical techniques that include derivatives. This sequence culminates with notions of prices that maximize revenue subject to a given demand function. A large number of such topic sequences involving univariate functions are examined.
Prerequisite: Grade 12U Advanced Functions or equivalent.

Prerequisites/Co-requisites: AP/ECON 1000 3.00 or AP/ECON 1010 3.00, or equivalent. Strongly recommended completion: high-school calculus or equivalent.

Course credit exclusions: SC/MATH 1000 3.00, SC/MATH 1013 3.00, SC/MATH 1300 3.00, SC/MATH 1505 6.00, SC/MATH 1513 6.00, SC/MATH 1530 3.00, SC/MATH 1550 6.00, GL/MATH/MODR 1930 3.00. Note: Acceptable course substitutes are available in the Calendar.

3. Required Course Text/Readings:

Essential Mathematics for Economic Analysis, fifth edition, Knut Sydsaeter and Peter Hammond with Arne Strom, Prentice Hall.

4. Weighting of Course:

Midterm	40% (16th June class time)
Final	60% (Date to be announced by Registar's office)

There are no makeups for missed in-class tests or quizzes. Anyone missing the midterm test will automatically have their final exam reweighted to be worth 100%. If a student receives a higher grade on the final exam than on the midterm test, the final exam grade will be worth 100% of the final grade.
There will be generally 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. Final course grades may be adjusted to conform to Program or Faculty grades distribution profiles.

5. Topics to be covered (We may not follow the order here)
I regularly assign problems from the text and go over as many solutions as I can in class.

Date	Description	Textbook Coverage
Week 1	Introduction & Topic 1 – Review of Functions • The Real Numbers • Inequalities • Fractions & Fractional Powers • Intervals and Absolute Values • Introduction to Functions • Basic Definitions • Graphs of Functions • Linear Functions • Linear Models	• Ch. 2: 2.1, 2.4 – 2.7 • Ch. 3: 3.3,3.6 • Ch. 4: 4.1 – 4.5 • Students should review all of Chapters 1-4
Week 2	Topic 1 – Review of Functions Continued • Quadratic Functions • Power Functions and Polynomials Topic 2 – Single-Variable Differentiation • Slopes of Curves • Tangents and Derivatives • Increasing and Decreasing Functions • Rates of Change • A Dash of Limits	• Ch. 4: 4.6, 4.8 • Ch. 6: 6.1- 6.5
Week 3	Topic 2 - Single-Variable Differentiation Continued • Simple Rules for Differentiation • Sums, Products and Quotients • Higher-Order Derivatives	• Ch. 6: 6.6, 6.7, 6.9
Week 4	Topic 3 – More on Differentiation • Chain Rule • Implicit Differentiation • Linear Approximations and Differentials • Elasticities	• Ch. 6: 6.8 • Ch. 7: 7.1, 7.4, 7.7

Date	Description	Textbook Coverage
Week 5	Topic 4 – Limits, Continuity and Series • More on Limits • Continuity • Infinite Sequences • Geometric Series • Total Present Value • Mortgage Repayments	• Ch. 7: 7.8, 7.9, 7.11 • Ch. 10: 10.4 – 10.6
Week 7	Topic 5 – Continuity and Differentiability • L'Hopital's Rule Topic 6 – Exponential and Logarithmic Functions • Exponential Functions • Logarithmic Functions	• Ch. 7: 7.12

		• Ch.6: 6.10, 6.11 • Ch. 4: 4.9-4.10
Week 8	Topic 7 – Single Variable Optimization • Simple Tests for Extreme Points • Economic Examples • The Extreme Value Theorem • Further Economic Examples	• Ch. 8: 8.2 – 8.5
Week 9	Topic 7– Single Variable Optimization - Continued • Local Extreme Points • Present Value • Inflection Points, Concavity, and Convexity	• Ch. 8: 8.6, 8.7 • Ch. 10: 10.3
Week 10	Topic 8 – Integration • Area and Definite Integrals • Indefinite Integrals • Properties of Definite Integrals • Economic Applications	• Ch. 9: 9.1 – 9.4
Week 11	Topic 9 – Further Topics in Integration • Integration by Parts • Integration by Substitution • Integration over Infinity	• Ch. 9: 9.5-9.7

Important Course Information for Students:

All students are expected to familiarize themselves with the following information, available on the Senate Committee on Curriculum & Academic Standards webpage;
http://www.yorku.ca/secretariat/policies/index-policies.html/

- York's Academic Honesty Policy and Procedures/Academic Integrity Website

  Academic Honesty and Integrity: Conduct that violates the ethical or legal standards of the University community or of one's program or specialization is subject to severe penalties. Students are responsible for understanding the nature and consequences of these offences, as contained in the Senate Policy on Academic Honesty, found on the York University Senate WEB page:
  http://www.yorku.ca/secretariat/policies/document.php?document=69

- Ethics Review Process for research involving human participants
  http://www.yorku.ca/secretariat/policies/document.php?document=94

- Course requirement accommodation for students with disabilities, including physical, medical, systemic, learning and psychiatric disabilities
  http://www.yorku.ca/secretariat/policies/document.php?document=68

- Student Conduct Standards
  http://www.yorku.ca/oscr/standards.html

- Religious Observance Accommodation
  https://w2prod.sis.yorku.ca/Apps/WebObjects/cdm.woa/wa/regobs