Mathematics for Economists Syllabus
Department of Economics
ECON 3700 / MATH 3700 Fall 2025

Dalhousie University operates in the unceded territories of the Mi'kmaw, Wolastoqey, and Peskotomuhkati Peoples. These sovereign nations hold inherent rights as the original peoples of these lands, and we each carry collective obligations under the Peace and Friendship Treaties. Section 35 of the Constitution Act, 1982, recognizes and affirms Aboriginal and Treaty rights in Canada.

We recognize that African Nova Scotians are a distinct people whose histories, legacies, and contributions have enriched the part of Mi'kma'ki known as Nova Scotia for over 400 years.

Course Instructor

John Rumsey | johndrumsey@gmail.com | Email "office hours" preferred. In person office hours by appointment

Course Description

This course presents mathematical methods used in modern economics. The lectures concentrate on the basic concepts of analysis, comparative statics and optimization theory. Topics include an introduction to set theory and matrix algebra, the implicit function theorem, unconstrained optimization, constrained optimization with equality and inequality constraints, and intertemporal choice.

Course Prerequisites

ECON 2200.03 (or ECON 2210.03 or ECON 2220.03), ECON 2201.03, and MATH 1000.03 or equivalent with minimum grades of C or permission of the instructor.

Course Structure

ECON/MATH 3700 will be delivered in-person and not recorded.

Lectures

On Mondays and Wednesdays from 4:05 pm to 5:25 pm in Life Sciences Centre C208

Course Materials

Detailed lecture notes will be available on the ECON3700 BrightSpace site for the course. The text *Mathematics for Economists* by C.P. Simon & L. Blume; published by Norton, 1994 is a suitable reference text.

Assessment

Component	Weight	Date
Assignments	20%	
Midterm	35%	**15 Oct 2025**
Final Exam	45%	

There will be eight assignments. Each assignment will have the same weight, 2.5% of the total 20%. The time interval between assignment due dates will be approximately one week. The Midterm be held during regular class time on **Wednesday, 15 October, 4:00 pm to 5:30 pm** and will cover the material presented prior to that date.

The date of the final exam will be set by the registrar and will cover all the course material.

Assignments must be done individually but discussion about the assignments is encouraged. Submit assignments electronically before the due date to the BrightSpace for the course. ".pdf" format is preferred.

Conversion of numerical grades to Final Letter Grades

$(89.5, 100] \to \mathsf{A}^+$	$(84.5, 89.5] \to \mathsf{A}$	$(79.5, 84.5] \to \mathsf{A}^-$	$(76.5, 79.5] \to \mathsf{B}^+$
$(72.5, 76.5] \to \mathsf{B}$	$(69.5, 72.5] \to \mathsf{B}^-$	$(64.5, 69.5] \to \mathsf{C}^+$	$(59.5, 64.5] \to \mathsf{C}$
$(54.5, 59.5] \to \mathsf{C}^-$	$(49.5, 54.5] \to \mathsf{D}$	$[0, 49.5] \to \mathsf{F}$	

Course Policies on Missed or Late Academic Requirements

Late assignments will not be accepted. Missed assignments will be given a score of zero. There is no make-up midterm and a missed midterm will be given a score of zero. If a class is cancelled (due to weather, for example) on the day when the in-class tests is scheduled, the test will be rescheduled. If a class is cancelled on a non-test day, the decision to make up the class will depend on circumstances.
The goal of these policies is fairness to everyone, but the policies may not apply in unusual circumstances.

Course Policies related to Academic Integrity

Each of the eight assignments is to be done individually, but consultation about the assignments with other students and with the instructor is allowed and is encouraged.

Learning Objectives

A student who is successful in this course should be able:

- To convert a system of linear equations into matrix format.
- Given a system of equations describing an economic model, compute the impact on the equilibrium value of an endogenous variable which results a small change in an exogenous variable.
- Determine whether a solution to a system of equations, which describes and economic model, exists.
- Compute the optimum values of choice variables (possibly time-dependent) in a system subject to equality and inequality constraints.

Course Content

Approximate Dates	*Topic*	*Notes*
3 Sep	Introduction	Ch. 1
8 Sep	Equilibrium Analysis	Ch. 2
10 - 22 Sep	Linear Models & Matrix Algebra	Ch. 3
24 Sep - 13 Oct	Differentiation and Comparative Statics	§4.1-§4.7
15 Oct	**Midterm**	
20 Feb	Analysis of Implicit Function Models	§4.8
22 Oct	Exponentials & Logarithms	Ch. 5
27 Oct	Taylor Series	Ch. 6
29 Oct, 3 Nov	Unconstrained Optimisation	Ch. 7
5, 17, 19 Nov	Optimization with Equality Constraints	Ch. 8
24,26 Nov	Optimization with Inequality Constraints	Ch. 9
3 Dec	Intertemporal Choice	Ch. 10

University Policies and Statements

Recognition of Mi'kmaq Territory

Dalhousie University would like to acknowledge that the University is on Traditional Mi'kmaq Territory. The Elders in Residence program provides students with access to First Nations elders for guidance, counsel, and support. Visit or e-mail the Indigenous Student Centre at 1321 Edward St or elders@dal.ca. Additional information regarding Mi'kmaq and Indigenous Relations (including the Elders in Residence program, Land Acknowledgements, Understanding Our Roots, and much more) can be found at:
https://www.dal.ca/about/mission-vision-values/mikmaq-indigenous-relations.html

Internationalization

At Dalhousie, 'thinking and acting globally' enhances the quality and impact of education, supporting learning that is "interdisciplinary, cross-cultural, global in reach, and orientated toward solving problems that extend across national borders." Additional internationalization information can be found at:
https://www.dal.ca/about/mission-vision-values/global-relations.html

Academic Integrity

At Dalhousie University, we are guided in all our work by the values of academic integrity: honesty, trust, fairness, responsibility, and respect. As a student, you are required to demonstrate these values in all the work you do. The University provides policies and procedures that every member of the university community is required to follow to ensure academic integrity. Additional academic integrity information can be found at:
https://www.dal.ca/dept/university_secretariat/academic-integrity.html

Accessibility

The Student Accessibility Centre is Dalhousie's centre of expertise for matters related to student accessibility and accommodation. If there are aspects of the design, instruction, and/or experiences within this course (online or in-person) that result in barriers to your inclusion, please contact the Student Accessibility Centre
(https://www.dal.ca/campus_life/academic-support/accessibility.html)
for all courses offered by Dalhousie with the exception of Truro. For courses offered by the Faculty of Agriculture, please contact the Student Success Centre in Truro
(https://www.dal.ca/about-dal/agricultural-campus/student-success-centre.html)

Conduct in the Classroom – Culture of Respect

Substantial and constructive dialogue on challenging issues is an important part of academic inquiry and exchange. It requires willingness to listen and tolerance of opposing points of view. Consideration of individual differences and alternative viewpoints is required of all class members, towards each other, towards instructors, and towards guest speakers. While expressions of differing perspectives are welcome and encouraged, the words and language used should remain within acceptable bounds of civility and respect.

Diversity and Inclusion – Culture of Respect

Every person at Dalhousie has a right to be respected and safe. We believe inclusiveness is fundamental to education. We stand for equality. Dalhousie is strengthened in our diversity. We are a respectful and inclusive community. We are committed to being a place where everyone feels welcome and supported, which is why our Strategic Direction prioritizes fostering a culture of diversity and inclusiveness (Strategic Priority 5.2). Additional diversity and inclusion information can be found at:
https://www.dal.ca/about/mission-vision-values/equity-diversity-inclusion-and-accessibility/about-office-equity-inclusion.html

Student Code of Conduct

Everyone at Dalhousie is expected to treat others with dignity and respect. The Code of Student Conduct allows Dalhousie to take disciplinary action if students don't follow this community expectation. When appropriate, violations of the code can be resolved in a reasonable and informal manner – perhaps through a restorative justice process. If an informal resolution can't be reached, or would be inappropriate, procedures exist for formal dispute resolution. The full Code of Student Conduct can be found at:
https://www.dal.ca/dept/university_secretariat/policies/student-life/code-of-student-conduct.html

Fair Dealing Policy

The Dalhousie University Fair Dealing Policy provides guidance for the limited use of copyright protected material without the risk of infringement and without having to seek the permission of copyright owners. It is intended to provide a balance between the rights of creators and the rights of users at Dalhousie. Additional information regarding the Fair Dealing Policy can be found at:
https://www.dal.ca/content/dam/www/about/leadership-and-governance/university-policies/fair-dealing-policy.pdf

Student Use of Course Materials

Course materials are designed for use as part of this course at Dalhousie University and are the property of the instructor unless otherwise stated. Third party copyrighted materials (such as books, 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. Copying this course material for distribution (e.g. uploading to a commercial third-party website) may lead to a violation of Copyright law.