DALHOUSIE UNIVERSITY

Faculty of Science Course Syllabus (Section A)
Department of Economics
Mathematics for Economists, ECON 3700 / MATH 3700
Winter Term 2023

Dalhousie University is located in Mi'kma'ki, the ancestral and unceded territory of the Mi'kmaq. We are all Treaty people

We acknowledge the histories, contributions, and legacies of the African Nova Scotian people and communities who have been here for over 400 years.

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

Lectures: Wednesdays Fridays 11:35 - 12:55
Course delivery: In-person and not recorded

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.

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 an the equilibrium value of an endogenous variable which results a small change in an exogenous variable, and identify the conditions under which such an impact can be computed.
- Compute the optimum values of choice variables (possibly time-dependent) in a system subject to equality and inequality constraints.

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.

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Course Assessment

Component	Weight	Date
Assignments	20%	
Midterm	35%	**15 Feb 2023**
Final Exam	45%	

There will be eight assignments sets. Each problem set 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 February, 11:30 am to 1:00 pm**. The date of the final exam will be set by the registrar and will take place during the regular April examination period.

Assignments must be done individually and submitted electronically before or on the due date. ".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

Late assignments will not be accepted. Missed assignments will be given a score of zero. There is no make-up midterm. 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.

Approximate Schedule / List of Topics

Dates	*Topic*	*Notes*
11 Jan	Introduction	Ch. 1
13 Jan	Equilibrium Analysis	Ch. 2
18 - 27 Jan	Linear Models & Matrix Algebra	Ch. 3
1 - 17 Feb	Differentiation and Comparative Statics	§4.1-§4.7
15 Feb	**Midterm**	
1,3 Mar	Analysis of Implicit Function Models	§4.8
8 Mar	Exponentials & Logarithms	Ch. 5
10 Mar	Taylor Series	Ch. 6
15,17,22 Mar	Unconstrained Optimisation	Ch. 7
24, 29 Mar	Optimization with Equality Constraints	Ch. 8
31 Mar, 5 Apr	Optimization with Inequality Constraints	Ch. 9
10, 11 Apr	Intertemporal Choice	Ch. 10