

## Introduction to Advanced Economic Theory

**Class location/time:** KTH 104/Mo 9:30AM – 11:20AM, We 10:30AM – 11:20AM

Instructor: Maxim Ivanov

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Office hours: Wednesday, 2:00PM–3:00PM

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### Course Objectives

This course is an introduction to the mathematical methods commonly used in economic theory. The purpose of the course is to make students comfortable with the application of mathematics to economic theory and prepare them for their third- and fourth- year economic courses. The course will review and cover topics in linear algebra, calculus, constrained and unconstrained optimization, differential equations and difference equations. The emphasis of the course will be on problem-solving with illustrative examples taken from various sub-fields of economics.

### Course Materials

**Textbook (mandatory):** “Fundamental Methods of Mathematical Economics”, by Alpha C. Chiang and Kevin Wainwright, 4th edition, McGraw Hill.

A copy of the textbook is listed as a course reserve at Mills Library (you can borrow it for one day)

### Tentative Course Outline

#### Textbook Chapters (as the course proceeds):

- *Introduction*

Equilibrium Analysis in Economics, Chapter 3.

- *Review of Linear Algebra*

Linear Models and Matrix Algebra, Chapters 4 and 5.

- *Competitive Static Analysis*

Comparative Statics and the Concept of Derivative, Chapter 6.

Rules of Differentiation and Their Use in Comparative Statics, Chapter 7.

Comparative-Static Analysis of General Function Models, Chapter 8

- *Optimization Problems*

Optimization: A Special Variety of Equilibrium Analysis, Chapter 9.

Exponential and Logarithmic Functions, Chapter 10.

The Case of More than One Choice Variable, Chapter 11.

Optimization with Equality Constraints, Chapter 12.

Further Topics in Optimization, Chapter 13

- *Dynamic Analysis*

Economic Dynamics and Integral Calculus, Chapter 14

Continuous Time: First-Order Differential Equations, Chapter 15.

Discrete Time: First-Order Difference Equations, Chapter 17.

Simultaneous Differential Equations and Difference Equations, Chapter 19.

### Practice questions

Practice problems will be posted on the course website and/or announced in class. They are important to prepare for mid-term and the final exams. Remember that the only way to learn the material in this course is to do lots of problems.

## Evaluation

**Final grades** will be based on: the mid-term exams (**60%**) and the final exam (**40%**). There will be 2 mid-term in-class exams. Each mid-term exam is worth **30%** of your final grade. The dates of the mid-term exams are:

*October 17 and November 14.*

The **final exam** is worth **40%** of your final grade. The final exam is administered during the final exam week and is comprehensive. The final exam is scheduled by the Registrar, and missed final exams will be dealt with under the Registrar's rules.

**Missed exams:** if you have a valid and verified reason not to take the midterm exam, you must notify the instructor within the time frame specified by the university policies. In this case, you will have to take the **make-up midterm exam (usually within 7 days since the date of the missed exam)**. The format of the make-up exam is identical to the format of the missed exam. Because the weight of each mid-term exam is **30%**, in the case of missing the mid-term exam you must come the Faculty Office and submit supporting documentation. **Filling up the MSAF form only is NOT sufficient for missing mid-term exams.**

**Grading:** the distribution of grades will follow the **grading curve** on the basis of scores at the end of the semester: **A – 20%, B – 25-30%, C – 25-30%, D – 10-15%, F – 10-15%**. These numbers are **tentative**. “+”s, “-”s, and minor adjustments (for example, because some students drop the class before the end of the semester), if needed, are based on the distribution of grades at the end of the semester.

**NOTE: all requests about changing the grading scheme, for example, using the standard grading scale, reallocating the weights of exams, dropping the lowest score, providing extra work, etc. will be DISREGARDED.**

## Calculators

Only university approved calculators will be permitted in the mid-term and the final exams.

## Photo ID

You will be required to show your university photo ID at all tests and the exam.

## COURSE MODIFICATION WARNING

The instructor and university reserve the right to modify elements of the course during the term. The university may change the dates and deadlines for any or all courses in extreme circumstances. If either type of modification becomes necessary, reasonable notice and communication with the students will be given with explanation and the opportunity to comment on changes. It is the responsibility of the student to check his/her McMaster email and course websites weekly during the term and to note any changes.

## ACADEMIC DISHONESTY

Academic dishonesty consists of misrepresentation by deception or by other fraudulent means and can result in serious consequences, e.g. the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: "Grade of F assigned for academic dishonesty"), and/or suspension or expulsion from the university. It is your responsibility to understand what constitutes academic dishonesty. For information on the various kinds of academic dishonesty please refer to the Academic Integrity Policy, specifically Appendix 3, located at <http://www.mcmaster.ca/academicintegrity/>

## FACULTY OF SOCIAL SCIENCES E-MAIL COMMUNICATION POLICY

Effective September 1, 2010, it is the policy of the Faculty of Social Sciences that all e-mail communication sent from students to instructors (including TAs), and from students to staff, must originate from the student's own McMaster University e-mail account. This policy protects confidentiality and confirms the identity of the student. It is the student's responsibility to ensure that communication is sent to the university from a McMaster account. If an instructor becomes aware that a communication has come from an alternate address, the instructor may not reply at his or her discretion.

[https://socialsciences.mcmaster.ca/documents/policy-documents/FACULTY%20OF%20SOCIAL%20SCIENCES%20e-mail%20policy%202010\\_12Dec12Revised.pdf](https://socialsciences.mcmaster.ca/documents/policy-documents/FACULTY%20OF%20SOCIAL%20SCIENCES%20e-mail%20policy%202010_12Dec12Revised.pdf)

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