

Cairo University
Faculty of Economics and Political Science
Department of Economics

Level 3

Course code (EE305): Mathematical Economics (1)

Academic Year 2018/2019 Fall 2018

Dr. Ashraf Samir; Assistant Professor of Economics

Office hours: 12 PM:1.30 PM (Sundays and Tuesdays)

❖ **Pre-requisites:**

- Introductory microeconomics.

❖ **Course Objectives:**

This course aims to teach the students how to apply the different mathematical tools on the theoretical aspects of economic analysis. It deals with the tools of differential calculus, integral calculus, matrix algebra, and differential equations. The main topics of this course include static analysis, comparative static analysis, optimization problems, and dynamic analysis.

❖ **Intended Learning Outcomes**

By the end of the course, students will be able to:

- Applying the different mathematical tools on the theoretical aspects of economic analysis.
- Understand differential calculus, integral calculus, matrix algebra, and differential equations.
- Improving students' presentation and speaking skills.
- Work in a group.

❖ **Course Design and Content:**

Part One: Introduction
1-1 Nature of mathematical economics (Ch. 1)
1-2 Economic Models (Ch. 2)
Part Two: Static (Or Equilibrium) Analysis
2-1 Equilibrium analysis in economics (Ch. 3)
2-2 Linear models and matrix algebra (Ch. 4 & 5)
Part Three: Comparative Static Analysis
3-1 Comparative statics and the concept of derivative (Ch. 6)
3-2 Rules of differentiation and their use in comparative statics (Ch. 7 & 8).
3-3 Logarithmic and exponential functions (Ch. 10)

Part Four: Optimization Problems

4-1 Optimization as a special variety of equilibrium analysis: The case of one choice variable (Ch. 9)
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4-2 Optimization problems in case of more than one choice variable (Ch. 11).
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4-3 Optimization with equality constraints (Ch. 12).
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4-4 Further topics in optimization (Ch. 13).
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Part Five: Dynamic Analysis

5-1 Economic dynamics and integral calculus (Ch. 14).

5-2 First order differential equations (Ch. 15)

➤ **Readings:**

Chiang, Alpha C., and Kevin Wainwright. (2005). *Fundamental Methods of Mathematical Economics*, 4th Edition, London, McGraw Hill Company.

➤ **Important notes:**

- I will post slide files on the course webpage.

The course webpage is (<https://ashraffeps.yolasite.com/>)

➤ **Evaluation:**

Item	Marks
Quizzes and Class work	30
Mid-Term Exam	20
<u>Final Exam</u>	50

Note on Cheating and Plagiarism: Neither will be tolerated. All assignments, exams, and papers for this class are individual work. No notes of any sort may be used on assignments and exams. By handing in a paper, each student is affirming that this paper is her/his own personal work and that it was written by her/him.
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