COURSE OUTLINE

1. GENERAL

SCHOOL	School of Applied Economics and Social Sciences
DEPARTMENT	Department of Regional and Economic Development
LEVEL OF COURSE	Undergraduate

COURSE CODE	ΠΟΑ1102	**SEMESTER**	1o

COURSE TITLE	Mathematics for Economists I
INSTRUCTOR	Spyridon Tsangaris
Office Hours	
email	tsangarisp@aua.gr

INDEPENDENT TEACHING ACTIVITIES if credits are awarded for separate components of the course, e.g., lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits	**WEEKLY TEACHING HOURS**	**ECTS CREDITS**
	5	5
Add rows if necessary. The organization of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialized general knowledge, skills development*	Specialized General knowledge
PREREQUISITE:	There are no prerequisites for the course
TEACHING AND ASSESSMENT LANGUAGE:	Greek
THE COURSE IS OFFERED TO ERASMUS STUDENTS	No
COURSE WEBPAGE (URL)	https://oeclass.aua.gr/eclass/courses/4849/

2. LEARNING OUTCOMES

1)Knowledge
- Solid understanding of fundamental mathematical concepts and principles.

2) Skills
- Understand how mathematical tools can be used to describe and analyze economic relationships and phenomena.
- Use mathematical tools to model and analyze economic problems.
- Use derivatives to solve maximization and minimization problems.
- Understand concepts of economic theory using mathematical methods.
- Students will be skilled in quantitative reasoning and critical thinking, allowing them to evaluate economic arguments.

3) Capabilities
- Solve economic problems, which may involve optimizing economic functions, calculating derivatives, integrals, and more.

- Decision-making
- Searching for, analyzing, and synthesizing data and information, with the use of necessary technology.
- Promotion of free, creative, and inductive thinking

3. CONTENT OUTLINE

This course introduces fundamental mathematical concepts that are applied in many fields, especially in economics and finance. It covers the topics of real numbers, sets, metric spaces, functions, limits, derivatives, differential calculus, definite integral, integral calculus, methods of evaluating definite integrals, methods for unconstrained optimization, and their economic applications.

Part 1
- Sets, Numbers
- Functions
- Introduction to limits
- Continuity
- Convex set

Part 2
- Differentiation
- Rules of differentiation
- Chain rule
- Total derivative
- Optimization of univariate functions
- Economic Applications: the profit-maximizing firm

Part 3
- Introduction to Partial Derivatives
- Partial derivatives of functions of two or more variables
- Higher-order partial derivatives
- Total differentials and linear approximations
- Optimization problems with multiple variables
- Economic applications (Elasticity of multivariable functions, Marginal analysis in economics)

Part 4
- Integration
- Integration Methods
- Definite integrals
- Indefinite integrals
- Generalized integrals
- Economic applications of integrals (Consumer and Producer Surplus)

4. TEACHING AND LEARNING METHODS - ASSESSMENT

TEACHING METHOD *Face-to-face, Distance learning, etc.*	face-to-face lectures
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, and communication with students*	• Using Excel, Mathematica, and open-source programs to plot functions. • Support Learning through the e-class platform. • Communicating with students using Zoom, Microsoft Teams, and Skype.

TEACHING ORGANIZATION *The manners and methods of teaching are described in detail.* *Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.* *The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS*	*Δραστηριότητα*	*Φόρτος Εργασίας Εξαμήνου*
	Lectures	65
	Theory study	27
	Exercises	33
	Total number of hours	125

STUDENT PERFORMANCE EVALUATION *Description of the evaluation procedure* *Language of evaluation, methods of evaluation, summative or conclusive, multiple-choice questionnaires, short-answer questions, open-ended questions, problem-solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of the patient, art interpretation, other* *Specifically defined evaluation criteria are given, and if and where they are accessible to students.*	• Final written exam • Optional midterm exam • Attendance and Class Participation

5. READING LIST

- Ξεπαπαδέας, Α., & Γιαννίκος, Ι. (2011). *Μαθηματικές Μέθοδοι στα Οικονομικά.* Εκδόσεις Gutenberg.

- Chiang, C. A., & Wainwright, K. (2004). *Fundamental Methods of Mathematical Economics*. McGraw Hill.

- Chiang, C. A., & Wainwright, K. (2009). Μαθηματικές Μέθοδοι Οικονομικής Ανάλυσης. Εκδόσεις Κριτική.

- Φλυτζάνης, Η. (2015). Μαθηματικά για Οικονομολόγους Ι. Εκδόσεις Μπένου.

- Λουκάκης, Μ. (2019). Πρόσκληση στα Μαθηματικά Οικονομικών και Διοικητικών Επιστημών, (τόμος Α'). Εκδόσεις Σοφία.

- Spivak, M. (2020). Διαφορικός και ολοκληρωτικός λογισμός. Πανεπιστημιακές Εκδόσεις Κρήτης.