UNIVERSITY OF PIRAEUS

1) GENERAL

SCHOOL	ECONOMICS, BUSINESS AND INTERNATIONAL STUDIES		
ACADEMIC UNIT	ECONOMICS		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	**ΟΚΜΑΘ06**	**SEMESTER**	1
COURSE TITLE	**MATHEMATICS I**		
INTEPENDENT TEACHING ACTIVITIES	**WEEKLY TEACHING HOURS**	**CREDITS**	
Lectures	4	6	
COURSE TYPE	General knowledge		
PREREQUISITE COURSES	-		
LANGUAGE OF INSTRUCTION and EXAMINATIONS	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES		
COURSE WEBSITE (URL)	https://eclass.unipi.gr/courses/EBI170/		

2) LEARNING OUTCOMES

Learning Outcomes

In recent years economic and business analysis has borrowed greatly from mathematics. This introductory course aims at providing the necessary technical background for an in-depth understanding of key concepts of both economics and business. The course touches up on topics of mathematics such as real numbers, sets, Cartesian product, binary relations, preference relations, basic algebraic identities, elements of combinatorics, equation and inequality solving techniques, systems of linear equations, Gaussian elimination, matrices, matrix operations, inverse matrices, criteria of invertibility and algorithms for finding inverses, determinants, real functions of a single real variable, limits, sequences, compound interest, continuity and differentiability of single variable functions. Special emphasis is given to the way these concepts and techniques are being applied for the solution of standard problems in business and economics.

Students are expected to be able to solve linear systems handling with ease key concepts of the theory of matrices and determinants. They are also expected to be able to solve real problems of compound interest and understand basic concepts of differential calculus of real functions of a single real variable.

General Competences

Understanding the quantitative nature of core microeconomic and macroeconomic problems.
Acquiring a solid knowledge of the mathematical terminology used in economics.
Ability to perform quantitative analysis to simple economic problems

3) SYLLABUS

- Mathematics and Economics – Introductory concepts
- Cartesia product – Binary relations – Preference relations
- Basic algebraic identities – Elements of combinatorics
- Equation and inequality solving techniques
- Linear systems – Gauss elimination
- Matrices
- Inverse matrices
- Determinants
- Real functions of a single real variable
- Limits
- Sequences – Compound interest
- Continuity
- Differentiability

4) TEACHING and LEARNING METHODS		
DELIVERY	In class lectures	
USE OF INFORMATION AND COMMUNICATION TECHNOLOGY	Use of ICT in lectures	
TEACHING METHODS	**Activity**	**Semester workload**
	Lectures	52
	Study	64
	Exercises	32
	Exam	2
	Course Total	150
STUDENT PERFORMANCE EVALUATION	The evaluation of the course is implemented through a final examination. The language of evaluation is Greek	
ATTACHED BIBLIOGRAPHY	-Suggested bibliography: • J. Bergin, Μαθηματικά για Οικονομολόγους με εφαρμογές, Εκδόσεις Gutenberg (2020). • Ε. Φούντας, Μαθηματικά Μοντέλα και Εφαρμογές, Εκδόσεις Βαρβαρήγου (2018). • Γ. Σαραφόπουλος και Ν. Μυλωνάς, Γραμμική Άλγεβρα, Βελτιστοποίηση και Δυναμική Ανάλυση στις Οικονομικές Επιστήμες, Εκδόσεις Τζιόλα. - Further reading: • N. Μιχελακάκης, Σημειώσεις Γραμμικής Άλγεβρας • Σ. Κώτσιος, Ασκήσεις Μαθηματικών για Οικονομολόγους, Εκδόσεις Κριτική. • B. Luderer, V. Nollau, K. Vetters, Mathematical Formulas for Economists, Springer-Verlag. • http://ocw.mit.edu/courses/mathematics/18-013a-calculus-with-applications-spring2005/ • Α. Ξεπαπαδέας, Ι. Γιαννίκος, Μαθηματικές Μέθοδοι στα Οικονομικά, Gutenberg (2011). • K. Sydsaeter, A. Storm, P. Berck, Economists' Mathematical Manual, Springer-Verlag. • M. Spivak, Calculus, Publish or Perish	