



UNIVERSITY OF PIRAEUS

FACULTY/SCHOOL	School of Economics, Business and International Studies		
DEPARTMENT	Department of Economics		
LEVEL OF STUDY	Undergraduate		
COURSE UNIT CODE	OKMA006	SEMESTER	1
COURSE TITLE	MATHEMATICS I		
WEEKLY TEACHNG HOURS	4	CREDITS (ECTS)	6
COURSE TYPE	Mandatory		
PREREQUISITE COURSES			
INSTRUCTION LANGUAGE	English	ASSESSMENT LANGUAGE	English
OPEN TO ERASMUS	Yes		

LEARNING OUTCOMES	<p>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.</p> <p>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.</p>
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GENERAL COMPETENCES	<p>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.</p>
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COURSE CONTENT	<ul style="list-style-type: none"> • 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
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USE OF ICT IN TEACHING	Use of ICT in lectures
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COURSE DESIGN	Activity/Method	Semester workload
	Lectures	52
	Tutorials	12
	Study	58
	Exercises	26
	Exam	2
	Total	150

COURSE ASSESSMENT	<p>The evaluation of the course is implemented through a final examination. The language of evaluation is Greek.</p>
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SUGGESTED BIBLIOGRAPHY	<p><i>-Suggested bibliography:</i></p> <ul style="list-style-type: none"> • 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. <p><i>- Related Journal: Journal of econometrics</i></p> <ul style="list-style-type: none"> • Ν. Μιχελακάκης, Σημειώσεις Γραμμικής Άλγεβρας • Σ. Κώτσιος, Ασκήσεις Μαθηματικών για Οικονομολόγους, Εκδόσεις Κριτική.
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| | <ul style="list-style-type: none">• B. Luderer, V. Nollau, K. Velters, <i>Mathematical Formulas for Economists</i>, Springer-Verlag.• http://ocw.mit.edu/courses/mathematics/18-013a-calculus-with-applications-spring-2005/• Α. Ξεπαλαδέας, Ι. Γιαννίκος, <i>Μαθηματικές Μέθοδοι στα Οικονομικά</i>, Gutenberg (2011).• K. Sydsaeter, A. Storm, P. Berck, <i>Economists' Mathematical Manual</i>, Springer-Verlag.• M. Spivak, <i>Calculus, Publish or Perish</i>. |
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