

COURSE OUTLINE: MATHEMATICS FOR ECONOMISTS I

GENERAL

SCHOOL	ECONOMICS AND BUSINESS		
ACADEMIC UNIT	ECONOMICS		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	ΜΠ101	SEMESTER	1st
COURSE TITLE	MATHEMATICS FOR ECONOMISTS I		
INSTRUCTOR(S)	Professor L. Zachilas		
INDEPENDENT TEACHING ACTIVITIES <i>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</i>		WEEKLY TEACHING HOURS	CREDITS
		3	6
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>			
COURSE TYPE <i>general background, special background, specialized general knowledge, skills development</i>	ECONOMIC ANALYSIS, GENERAL BACKGROUND		
PREREQUISITE COURSES:	NO		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES		
COURSE WEBSITE (URL)	https://www.econ.uth.gr/σπουδές/προπτυχιακό/περιγραφή-μαθημάτων/1ο-εξάμηνο/μαθηματικά-ι		

LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*

- *Guidelines for writing Learning Outcomes*

The course is aimed at first-year students and seeks to introduce them to new mathematical concepts not covered in secondary education, as well as demonstrate how these mathematical concepts are applied in Economics. Additionally, the course aims to provide Economics students with the necessary mathematical tools to understand economic concepts that are closely linked to mathematics. Upon successful completion of the course, the student will be able to:

- Understand the subject, methodology, and various applications of Mathematics in Economics.
- Comprehend the concept of the Economic Model (Mathematical Model).
- Identify the mathematical concepts that are directly related to economic concepts.
- Grasp the basic principles of Combinatorial Analysis and Probability Theory, which are essential for the study of Statistics.
- Understand matrices, determinants, and linear systems, which are directly needed in Microeconomics, Macroeconomics, and Econometrics courses.

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology

Adapting to new situations

Decision-making

Working independently

Team work

Working in an international environment

Working in an interdisciplinary environment

Production of new research ideas

Project planning and management

Respect for difference and multiculturalism

Respect for the natural environment

Showing social, professional and ethical responsibility and

sensitivity to gender issues

Criticism and self-criticism

Production of free, creative and inductive thinking

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Others...

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- Research, analysis, and synthesis of data and information, utilizing the necessary technologies.
- Decision-making.
- Independent work.
- Work in an international environment.
- Critical thinking and self-reflection.
- Development of free, creative, and inductive thinking.

SYLLABUS

1. **Introduction to Economic Mathematics – Economic Models**
2. **Sets and Numbers:** Sets, operations with sets, properties, ordered pairs.
3. **Combinatorial Analysis:** Basic counting principles, permutations, permutations with repetition, circular permutations, arrangements, arrangements with repetition, combinations, combinations with repetition.
4. **Probability:** Sample space, events, mutually exclusive events, definition of probability, laws, conditional probability, independent events.
5. **Relations and Functions:** Types of functions, functions of two or more independent variables (definition).
6. **Static Analysis:** The concept of equilibrium, market equilibrium, market equilibrium using a non-linear model, general equilibrium, two-product market model.
7. **Matrices:** Introduction, types of matrices, matrix operations, properties of operations, identity and zero matrices, inverse and reciprocal matrices, determinants, properties of determinants, linear systems (inverse method and determinant method), homogeneous systems of equations, applications of linear systems in Economics.

Tutorial exercises are conducted throughout the semester.

TEACHING and LEARNING METHODS - EVALUATION

DELIVERY <i>Face-to-face, Distance learning, etc.</i>	Face-to-face														
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i>															
TEACHING METHODS <i>The manner 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</i>	<table border="1"> <thead> <tr> <th>Activity</th><th>Semester workload</th></tr> </thead> <tbody> <tr> <td>Lectures</td><td>39</td></tr> <tr> <td>Study and analysis of bibliography</td><td>105</td></tr> <tr> <td>Tutorial exercises</td><td>26</td></tr> <tr> <td>Lab exercises</td><td>5</td></tr> <tr> <td>Exams</td><td>5</td></tr> <tr> <td>Course total</td><td>180</td></tr> </tbody> </table>	Activity	Semester workload	Lectures	39	Study and analysis of bibliography	105	Tutorial exercises	26	Lab exercises	5	Exams	5	Course total	180
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STUDENT PERFORMANCE EVALUATION <i>Description of the evaluation procedure</i> <i>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 patient, art interpretation, other.</i> <i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i>	The final grade for the course is determined by choosing one of the following two alternatives: • Written examinations at the end of the semester, accounting for 100% of the final grade, including multiple-choice questions, open-ended questions, and critical analysis. • Written assessment through three progress tests, consisting of multiple-choice questions, open-ended questions, and critical analysis: (20%) + (20%) + (60%), conducted after the completion of lectures. The above evaluation criteria are communicated to students during the first lecture of the course, and the information remains continuously accessible via relevant announcements on the course's e-class platform. ERASMUS students follow the same evaluation methods but are taught and examined in English.
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ATTACHED BIBLIOGRAPHY

• Πρόσκληση στα Μαθηματικά, τόμος Α', Μανώλης Λουκάκης, Εκδόσεις ΣΟΦΙΑ • Μαθηματικά για Οικονομολόγους με Εφαρμογές, James Bergin, Εκδόσεις Γ. ΔΑΡΔΑΝΟΣ ΚΑΙ ΣΙΑ Ε.Ε. • Μαθηματικά των Επιστημών Οικονομίας και Διοίκησης, Ian Jacques, Εκδόσεις Broken Hill • Λογισμός Συναρτήσεων μιας Μεταβλητής και Γραμμική Άλγεβρα, Μυλωνάς Νικόλαος, Σχοινάς Χρήστος, Παπασχοινόπουλος Γ., ΕΚΔΟΣΕΙΣ Α. ΤΖΙΟΛΑ & ΥΙΟΙ Α.Ε.
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