COURSE OUTLINE

(1) GENERAL

SCHOOL	Economics and Public Administration		
DEPARTMENT	ECONOMIC AND REGIONAL DEVELOPMENT		
LEVEL OF STUDY	Undergraduate		
COURSE CODE	8005	**SEMESTER OF STUDY**	**A'**
COURSE TITLE	**MATHEMATICS I**		

SELF-ENDED TEACHING ACTIVITIES In case the credits are awarded in separate parts of the course, e.g. Lectures, Laboratory Exercises, etc. If the credits are awarded uniformly for the entire period, enter the weekly teaching hours and total credits.	**WEEKLY TEACHING HOURS**	**CREDIT UNITS**
	4	6
Add rows if necessary. The teaching organization and methods are described in detail in (d).		

COURSE TYPE *general knowledge, special knowledge, skill development*	General knowledge, skill development
PREREQUISITE COURSES:	None
TEACHING and EXAMINATION LANGUAGE:	Greek
THE COURSE IS OFFERED TO ERASMUS STUDENTS	No
COURSE WEBSITE (URL)	https://openeclass.panteion.gr/courses/TMI117/

(2) LEARNING OUTCOMES

Learning outcomes

The course's learning outcomes are described as the specific knowledge, skills and abilities of an appropriate level that the students will acquire after successfully completing the course.

Consult Appendix A

• Description of the Level of Learning Outcomes for each course of study according to the Qualifications Framework of the European Higher Education Area

• Descriptive Indicators for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Annex B

• Comprehensive Guide to Writing Learning Outcomes

Upon successful completion of the course, students are expected to understand the basic concepts of linear algebra as well as the extension of differential calculus to functions of several variables. In particular, they will be able to:

- Examine the linear independence of vectors and the basis of a vector space.
- Do operations with matrices.
- Calculate determinants and solve systems.
- Examine the rank of a matrix.
- Calculate the eigenvalues, eigenvectors of a matrix and evaluate its diagonal form.
- Understand quadratic form.
- Calculate partial derivatives of functions of several variables and calculate convex and concave functions of several variables.
- Compute extrema with and without constraints in functions of many variables.

General Competences

They are considering the general skills that the graduate must have acquired (as stated in the Diploma Appendix and listed below); which / which of them is the course aimed at?

Search, analysis and synthesis of data and information using the necessary technologies.
Adaptation to new situations
Decision making
Autonomous work
Teamwork
Work in an international environment.
Work in an interdisciplinary environment.
Generating new research ideas
Project planning and management
Respect for diversity and multiculturalism
Respect for the natural environment
Demonstrating social, professional and ethical responsibility and sensitivity to gender issues
Exercise criticism and self-criticism.
Promotion of free, creative and inductive thinking
Others

The course aims to learn the basic mathematical tools used in Economics.

(3) COURSE CONTENT

The course provides an introduction to Linear Algebra as well as into functions of several variables.

The following thematic areas are covered in the lectures:

- Vectors, vector spaces, linear independence of vectors.
- Matrices, determinants, matrix inversion methods, matrix order, linear systems, characteristic values, characteristic vectors, diagonalization, matrix trace, and quadratic forms.
- Multivariable differential calculus and optimization and constrained optimization of functions of several variables.

(4) TEACHING AND LEARNING METHODS – EVALUATION

TEACHING METHOD *Face-to-face, Distance learning etc.*	Face to face
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES *Use of I.C.T. in Teaching, Laboratory Education, in Communication with students* *Χρήση Τ.Π.Ε. στη Διδασκαλία, στην Εργαστηριακή Εκπαίδευση, στην Επικοινωνία με τους φοιτητές*	*Use of I.C.T. in Teaching, in weekly progress and the final written exam, in teaching support, as well as in Communication with students* https://openeclass.panteion.gr/courses/TMI117/
TEACHING ORGANIZATION *The way and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercises, Field Exercises, Literature Study & Analysis, Tutorials, Internships (Placement), Clinical Exercises, Art Workshops, Interactive Teaching, Educational Visits, Study Preparation (Projects), Writing Papers / Assignments, Artistic Creation, etc. The student's study hours are listed for each learning activity, and the hours of unguided study according to ECTS principles Activity Semester Workload.*	***ACTIVITY*** / ***SEMESTER WORKLOAD*** Lectures: 52 Unguided Study: 128 **Total Course (30 hours per ECTS): 180**
STUDENT EVALUATION *Description of the evaluation process Assessment Language, Assessment Methods, Formative or Deductive, Multiple Choice Tests, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignments, Report / Report, Oral Examination, Public Presentation, Laboratory Work, Clinical Patient Examination, Artistic Interpretation, Other / Others* *Explicitly defined evaluation criteria are mentioned, and if and where they are accessible to students.*	*Description of the evaluation process* - Written exam at the end of the semester: 100% *Student Assessment Methods* - Written Examination *Communication of the explicitly defined evaluation criteria for students* - In the study guide - On the course website: https://openeclass.panteion.gr/courses/TMI117/

(5) RECOMMENDED BOOKS AND JOURNALS

- Suggested Literature:

- Berkin J. (2015). *Μαθηματικά για οικονομολόγους με εφαρμογές*, Εκδόσεις Δαρδανός.
- Chiang A., Wainwright K. (2009). *Μαθηματικές μέθοδοι οικονομικής ανάλυσης*, 2η έκδοση, Κριτική.
- Hoy M., Livernois J., McKenna C., Stengos T., Rees R. (2013). *Μαθηματικά Οικονομικών Επιστημών*, Εκδόσεις Gutenberg.
- Ξεπαπαδέας Α.Π. και Γιαννίκος Ι.Χ. (2007). *Μαθηματικές Μέθοδοι στα Οικονομικά.*

Θεωρία και Εφαρμογές, Εκδόσεις Δαρδανός.