COURSE OUTLINE

1. GENERAL

SCHOOL	APPLIED ECONOMIC AND SOCIAL SCIENCES
ACADEMIC UNIT	AGRIBUSINESS AND SUPPLY CHAIN MANAGEMENT
LEVEL OF STUDIES	*Undergraduate*

COURSE CODE	**GEN206**	**SEMESTER**	2nd

COURSE TITLE	CALCULUS II

INDEPENDENT TEACHING ACTIVITIES	**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures	4	5

COURSE TYPE	General Background
PREREQUISITECOURSES	NO
LANGUAGE OF INSTRUCTION and EXAMINATIONS	Greek
IS THE COURSE OFFERED forERASMUS STUDENTS?	YES (in English)
COURSE WEBSITE(URL)	https://oeclass.aua.gr/eclass/courses/4855/

2. LEARNING OUTCOMES

Learning Outcomes
The aim of the course is: To introduce students to the fundamentals of Linear Algebra, functions of many variables and ordinary differential equations which are relevant to economy and management. **Upon successful completion of the course, the student will be able to:** ● Distinguishes the basic principles of Linear Algebra. ● Understand and use the mathematical models. ● Apply the mathematical models in order to describe economic and managerial phenomena. ● Apply the mathematical models in order to comprehend and foresee economic trends. ● Understands the basic "tools" for dealing with theoretical and practical problems that arise in the modern business environment.

General Competences
Adapting to new situations Decision-making Working independently Teamwork

Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas Teamwork
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

3. SYLLABUS

1. Matrices and Algebra of Matrices. Line Table, Column Table, Square Tables, Triangular Tables, Tiered Tables.
2. Transpose of a Matrix. Determinants and properties of Determinants.
3. Inverse of a Matrix. Inverse Matrix Method. Cramer's Rule for nxn Linear Systems. Gauss-Jordan method. Characteristic polynomial of a Matrix, Cayley-Hamilton Theorem.
4. Systems of Linear Equations. Elimination for Solving Systems of Linear Equations.
5. Vector Spaces. Linear Dependent and Independent Vectors.
6. Basis and Dimension of a Vector Space. Vector Subspaces.
7. Linear Mappings. Eigenvalues and Eigenvectors.
8. Applications to problems of Economy and Management.
9. Functions of many variables, Partial derivatives.
10. Optimization of functions of many variables with and without constraints.
11. Multiple integrals.
12. Introduction to ordinary differential equations, differential equations of first and higher order.
13. Mathematical modeling of problems related to economy and management and methods to solve such problems.

A combination of teaching and learning methods will be used, aiming at the active participation of the students and the practical application of the thematic units under examination; there will also be lectures using audiovisual media, discussions, and analyses of case studies on real business issues, experiential (group) activities, as well as projections of relevant videos. The students will also undertake an individual or group project. Furthermore, articles, audiovisual lecture materials, web links/addresses, useful information, case studies and exercises for further practice are posted in digital form on the AUA Open e-Class platform.

4. TEACHING and LEARNING METHODS - EVALUATION

DELIVERY	Face –to- face, Distance learning
USE OF INFORMATION and COMMUNICATIONS TECHNOLOGY	• Support of the learning process through the University's AUA Open eClass platform (integrated e-Course Management System) • Support of lectures using presentation software • Use of audiovisual material • Use of web applications **Communication with students**: face to face at office hours, email, eclass platform

TEACHING METHODS	Activity	Workload
	Lectures (direct)	52
	Writing paper/ papers	32
	Independent Study	39
	Advisory support	0,5
	Exams	*2*
	Course Total (Approximately 25 hours of workload per credit unit125.5)	*125,5 h*

STUDENT PERFORMANCE EVALUATION	The evaluation process is in the language that the course is taught (Greek or English) and consists of:
	Compulsory written final examination at the end of the semester (weighting factor **100**%) which may includes:
	• Multiplechoice questionnaires
	• Open-endedquestions
	• Problemsolving
	• Oral examination
	Evaluation criteria: correctness, completeness, clarity
	Special learning difficulties:
	Students with **special learning difficulties** in writing and reading (as they are certified and characterized by a competent body) are examined based on the procedure provided by the Department.
	Specifically-Defined Criteria:
	The evaluation criteria are made known during the first lesson and are clearly stated on the course website and the AUA Open e-class platform. The answers to the exam questions are posted on the AUA Open e-Class platform after the exam. The students are allowed to see their exam paper after its grading (during the announced office hours) and receive explanations about the grade they received.

5. ATTACHED BIBILIOGRAPHY

Suggested bibliography:
- Φ. Κουτελιέρης, Ν. Σιάννης, Γραμμική Άλγεβρα, Εκδόσεις Τζιόλα, 2008.
- Μαρία Μαύρη, Οικονομικά Μαθηματικά, Εκδόσεις Προπομπός, 2013
- Θ. Μ. Ρασσιάς, Μαθηματική Ανάλυση II, Εκδόσεις Συμεών, 2007
- Α. Σ. Κυριαζής, Β.Ι. Σεβρόγλου, Απειροστικός Λογισμός II: Συναρτήσεις Πολλών Μεταβλητών, Εκδόσεις Έναστρον, 2011
- Μ. Λουκάκης, Μαθηματικά Οικονομικών Επιστημών (Β' Τόμος), Εκδόσεις Σοφία, 2008.
- Β.Ν. Κατσίκης, Στ. Κώτσιος, Γενικά Μαθηματικά για την Οικονομία και τη Διοίκηση, Εκδόσεις Τσότρας, 2018

- Gilbert, Strang, Γραμμική Άλγεβρα, Πανεπιστημιακές Εκδόσεις Κρήτης, 2008
- G. B. Thomas, R. L. Finney, M. D. Weir, F. R. Giordano, Απειροστικός Λογισμός, Τόμος ΙΙ, Πανεπιστημιακές Εκδόσεις Κρήτης, 2009
- T. M. Apostol, Calculus V. 2, John Wiley and Sons, 1969

Related academic journals:
- Mathematical Programming.
- Journal of Functional Analysis.
- Linear Algebra and its Applications.
- Archiv der Mathematik.