

COURSE OUTLINE

1. GENERAL

SCHOOL	APPLIED ECONOMIC AND SOCIAL SCIENCES		
ACADEMIC UNIT	AGRIBUSINESS AND SUPPLY CHAIN MANAGEMENT		
LEVEL OF STUDIES	<i>Undergraduate</i>		
COURSE CODE	G5106	SEMESTER	1st
COURSE TITLE	CALCULUS I		
INDEPENDENT TEACHING ACTIVITIES	WEEKLY TEACHING HOURS	CREDITS	
Lectures	4	5	
COURSE TYPE	General Background		
PREREQUISITE COURSES	NO		
LANGUAGE OF INSTRUCTION and EXAMINATIONS	Greek		
IS THE COURSE OFFERED for ERASMUS STUDENTS?	YES (in English)		
COURSE WEBSITE(URL)	https://oeclass.aua.gr/eclass/courses/4842/		

2. LEARNING OUTCOMES

Learning Outcomes
<p>The aim of the course is: To introduce students to the basic mathematical fundamentals of Calculus which are relevant to economy and management.</p> <p>Upon successful completion of the course, the student will be able to:</p> <ul style="list-style-type: none"> • Distinguishes the basic principles of Differential and Integral Calculus. • 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
<p>Adapting to new situations</p> <p>Decision-making</p> <p>Working independently</p>

<p>Teamwork</p> <p>Working in an international environment</p> <p>Working in an interdisciplinary environment</p> <p>Production of new research ideas Teamwork</p> <p>Project planning and management</p> <p>Respect for difference and multiculturalism</p> <p>Respect for the natural environment</p> <p>Showing social, professional, and ethical responsibility and sensitivity to gender issues</p> <p>Criticism and self-criticism</p> <p>Production of free, creative and inductive thinking</p>

3. SYLLABUS

<ol style="list-style-type: none"> 1. The set of Real numbers. Algebraic calculus. 2. Sequences and series of real numbers. 3. Functions of real variable. Limits of functions of one real variable. 4. Continuity and convergence of functions of one real variable. 5. Economic functions. 6. Marginal functions, elasticity. 7. Equations of the straight line in the plane and in the 3-dim space. 8. System of linear equations. Equations of the plane in the 3-dim Euclidean space. 9. Derivative and differential of functions of one real variable. Fundamental theorems of Calculus. 10. Differentials of higher order. 11. Graphs of functions of one real variable. 12. Definite and indefinite integrals, techniques of integration and fundamental theorems of Integral Calculus 13. Applications of calculus to economy. <p>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.</p>

4. TEACHING and LEARNING METHODS - EVALUATION

DELIVERY	Face –to- face, Distance learning
USE OF INFORMATION and COMMUNICATIONS TECHNOLOGY	<ul style="list-style-type: none"> • 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 <p style="text-align: center;">Communication with students: face to face at office</p>

	hours, email, eclass platform	
TEACHING METHODS	<i>Activity</i>	<i>Workload</i>
	Lectures (direct)	52
	<i>Writing paper/ papers</i>	32
	<i>Independent Study</i>	39
	<i>Advisory support</i>	0,5
	<i>Exams</i>	2
	<i>Course Total (Approximately 25 hours of workload per credit unit125.5)</i>	125,5 h
STUDENT PERFORMANCE EVALUATION	<p>The evaluation process is in the language that the course is taught (Greek or English) and consists of:</p> <p>Compulsory written final examination at the end of the semester (weighting factor 100%) which may includes:</p> <ul style="list-style-type: none"> • Multiplechoice questionnaires • Open-endedquestions • Problemsolving • Oral examination <p>Evaluation criteria: correctness, completeness, clarity</p> <p>Special learning difficulties:</p> <p>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.</p> <p>Specifically-Defined Criteria:</p> <p>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.</p>	

5. ATTACHED BIBLIOGRAPHY

Suggested bibliography:

- Teresa Bradley, Μαθηματικά για τα Οικονομικά και τη Διοίκηση, Εκδόσεις Κριτική, 2015 (2η έκδοση).
- Θ. Μ. Ρασσιάς, Μαθηματική Ανάλυση Ι, Εκδόσεις Τσότρας, 2014.
- Δημητρακούδης, Θεοδώρου, Κικίλιας, Κουρής, Παλαμούρδας, Διαφορικός-Ολοκληρωτικός Λογισμός, Εκδόσεις Δηρος, 2002 (2η έκδοση).
- Α. Κυριαζής, Στοιχεία Απειροστικού Λογισμού Συνάρτησης μιας Μεταβλητής, Εκδόσεις Interbooks, 2004
- Χ. Ε. Αθανασιάδης, Ε. Γιαννακούλας, Σ.Χ. Γιωτόπουλος, Γενικά Μαθηματικά – Απειροστικός Λογισμός, Τόμος Ι, Εκδόσεις Συμμετρία, 2009

- Μαρία Μαύρη, Οικονομικά Μαθηματικά, Εκδόσεις Προπομπός, 2013
- Μ. Λουκάκης, Μαθηματικά Οικονομικών Επιστημών (Α' Τόμος), Εκδόσεις Σοφία, 2002.
- Μ. Λουκάκης, Πρόσκληση στα Μαθηματικά, Εκδόσεις Σοφία, 2012.
- Χ. Μασούρος, Χ. Τσίτουρας, Γενικά Μαθηματικά, Εκδόσεις Τσότρας, 2016.
- Π.Κατερίνης, Η.Φλυτζάνης, Ανώτερα Μαθηματικά, Εκδόσεις Μπένου, 2010.
- Χ. Φράγκος, Ανώτερα Μαθηματικά, Εκδόσεις Σταμούλη, 1999.
- Tom Apostol, Calculus, John Wiley & Sons Inc. 1969.
- W. Briggs, L. Cochran, and B. Gillett, Απειροστικός Λογισμός, Εκδόσεις Κριτική, 2018

Related academic journals:

- Inventiones mathematicae.
- Journal of Functional Analysis.
- Proceedings of the American Mathematical Society.
- Archiv der Mathematik.