



UNIVERSITY OF NICOSIA ΠΑΝΕΠΙΣΤΗΜΙΟ ΛΕΥΚΩΣΙΑΣ

University of Nicosia, Cyprus

Course code EDUE-132	Course title Topics from contemporary mathematics	ECTS Credits: 6
Department Paedagogical Studies	Semester Fall/Spring	Prerequisites EDUE-131
Type of Course Elective	Field Mathematics	Language of Instruction Greek
Level of Course Undergraduate	Year of Study 1st	Lecturer Dr Nicholas Mousoulides
Mode of Delivery face-to-face	Work Placement N/A	Co-requisites None

Course Objectives:

The purpose of this course is to provide teachers with an overview of the development of differential and integral calculus, basic elements of non-Euclidean geometries, the axiomatization of algebra and elements of matrix algebra, logical propositions and algebra propositions, and statistics and probability.

Learning Outcomes

Upon completing the course students should be able to:

- Demonstrate a sound understanding of the development of differential and integral calculus.
- Demonstrate an understanding of the core elements of non-Euclidean geometries.
- Demonstrate ability to apply concepts and processes from algebra and matrix algebra in solving relevant problems.
- Demonstrate ability to solve to problems related to cartesian products, binary relations, and functions.
- Demonstrate ability to solve to problems related to logical propositions and algebra propositions.
- Demonstrate a sound understanding of the logic gates and logic circuits and demonstrate ability to solve relevant problems.
- Demonstrate ability to solve to problems related to core concepts form statistics and probability.

Course Content

1. Differential and integral calculus
2. Geometry and elements of non-Euclidean geometries
3. Axiomatization of algebra, elements of matrix algebra
4. Number theory, cartesian products, binary relations, functions.
5. Logical propositions, algebra propositions.
6. Definition and examples of Boolean algebra.
7. Logic gates and logic circuits.
8. Statistics and Probability

Learning Activities and Teaching Methods:

Lecture, individual and group work, student presentations

Assessment Methods:

Formative assessment (Midterm and Final Exams), Collaborative work, Presentations, Discussions

Required textbooks/reading:

Philippou, G. (2003). *Introduction to the Fundamental Concepts of Mathematics*. Athens: Atrapos.

Recommended Textbooks/Reading:

Lemonides, Ch. (2000). *Arithmetics and Number Theory for the Elementary School Teacher*. Athens: Patakis.

Rotman, J. (1998). *Journey into Mathematics (An introduction to Proofs)*. Prentice Hall.