Level: bachelor academic studies of physics	
Course title: Mathematics I	
Status: obligatory	
ECTS: 8	
Requirements: none	

Learning objectives

The students of physics should be prepared to apply their knowledge of advanced mathematics, for examination and the graphs of functions, the calculation of indefinite and definite integrals and elements of linear algebra.

Learning outcomes

The students will possess the necessary knowledge in mathematics: elements of linear algebra, limit sequences and function, continuity of a function, derivative and properties of the derivative, indefinite and definite integrals with applications, mathematical models in physics.

Syllabus

Theoretical instruction

Systems of linear equations, solving and discussion. Definition and properties of determinants. Definition and properties of matrices, the sum of matrices, the multiplication of matrices and inverse matrices. Definition and properties of vectors, dot product, vector product, mixed product. Analytic geometry. Mathematical models in physics.

The field of real numbers. Definition of function, sequences, limit sequences and function with properties and algebraic operations and basic theorems. Properties of functions without and with the use of the first derivative. Geometric and physical interpretation of the first derivative, higher order derivatives. L'Hopital's Rule, the mean value theorem. Mathematical models in physics. Basic types of indefinite integrals. Definition of definite integral. The applications of definite integral. Areas in the plane. Volumes. Lengths of curves. Surface area of revolution. Mathematical models in physics.

Practical instruction

Problem solving following the theoretical material.

Weekly teaching load				Other:
Lectures: 5	Exercises: 5	Other forms of teaching: -	Student research: -	