

Level: bachelor				
Course title: Elements of algebra (I121)				
Status: obligatory for the module of <i>Computer Science</i>				
ECTS: 8				
Requirements: none				
Learning objectives: Introducing the basic algebraic structures and laws, as well as systematization of number structures and properties of polynomials in that direction. Introducing practical techniques for numbers, polynomials, systems of linear equations, determinants and matrices.				
Learning outcomes: <i>Minimal.</i> Understanding the basic algebraic structures and related notions, as well as the ability to solve simple problems. Understanding constructions and properties of sets of numbers. Problem-solving using mathematical induction, solving systems of congruencies and Diophantine equations, finding roots of polynomials. Mastering methods of solving systems of linear equations, calculating determinants and finding the inverse matrix. <i>Desirable.</i> A successful student will be able to solve advanced problems about algebraic structures, numbers and polynomials, to recognize basic algebraic laws, structures and their properties in various areas of mathematics.				
Syllabus <i>Theoretical instruction:</i> Operations and algebraic structures. Groupoids and their properties, subgroupoids, factor-groupoids, homomorphisms, direct products. Semigroups, semigroups of words, quasigroups. Groups. Rings. Fields. Lattices and Boolean algebras. Natural numbers. The ring of integers. The Euclid's algorithm. Linear Diophantine equations. Rational, real and complex numbers. Systems of linear equations and Gaussian elimination. Vector spaces. Matrices and determinants. Cramer's rule. The inverse matrix. Polynomials, divisibility and roots of polynomials. Lagrange interpolation. Viet's formulas. <i>Practical instruction:</i> follows theoretical instructions.				
Weekly teaching load				Other: -
Lectures: 3	Exercises: 3	Other forms of teaching:-	Student research: -	