Level: bachelor	
Course title: Elements of mathematical logic (I111)	
Status: obligatory for the module of *Computer science*	
ECTS: 9	
Requirements: none	

Learning objectives: Systematization of the foundations of mathematics, establishing methods of logical deduction, and developing ability for the correct and creative solutions to mathematical problems. Introducing students to the basic concepts of mathematical logic and its place in mathematics.

Learning outcomes:
Minimal. Learning the rules of the language of mathematics and basic methods of proving. Recognition and ability to use tautologies and valid formulas as well as the corresponding formal theories. Managing constructions of sets. Understanding and constructing relations, especially equivalence relations and partial orderings. Understanding the notion of function and examining its properties.
Desirable. Creatively using the rules of mathematical and logical deduction in solving complex problems and proving theorems. Understanding interpretations of first-order formulas and constructing models. Ability to employ the knowledge on relations and functions in other areas of mathematics.

Syllabus
Theoretical instruction: Various directions in founding mathematics, paradoxes. Propositional formulas, propositional algebra. Normal forms. Bases of propositional algebra. Switch circuits and logic circuits. Hypotheses and consequences. Predicate calculus. Valid formulas. Prenex form and Skolemization. FO resolution. Formal theories, propositional and predicate calculus as formal theories. Elements of set theory. Algebra of sets. Relations. Equivalence relations and partial orderings. Functions, inverse functions, operations. Cardinal numbers. Cantor diagonalization.
Practical instruction: follows theoretical instructions.

Weekly teaching load				Other: -
Lectures: 3	Exercises: 3	Other forms of teaching:-	Student research: -	