DESCRIPTION OF STUDY MODULE[*]

Study programme	**Applied Informatics and Programming**		

Study module	**BASICS OF LOGIC AND DISCRETE MATHEMATIC**	**Credits in total**	**4**

Learning outcomes
− Knows, understands and applies the basic mathematical logic and discrete mathematics statements and methods. − Knows mathematical logic and discrete mathematics scope. − Know the information coding principles. − Able to apply basic laws of logic in practice. − Knows how to formalize statements. − Able to reason logically. − Able to simulate, describe and solve practical computing tasks by using discrete mathematics knowledge.
Aims of study module
The purpose of this course is to understand and use (abstract) discrete structures that are backbones of computer science. In particular, this class is meant to introduce logic, proofs, sets, relations, functions, algorithms, graph, with an emphasis on applications in computer science.
Annotation of a study module
This course covers elementary discrete mathematics for computer science. It emphasizes mathematical definitions and proofs as well as applicable methods. Topics include formal logic notation, proof methods; sets; relations and functions, elementary graph theory; general concepts of cryptography.
Topics of the subject
1. Logical class. 2. Propositional logic. 3. Normal forms. 4. Predicate logic. 5. Set theory 6. Preparation for control work (midterm exam). Assignments. 7. Control work (midterm exam). 8. Relations and functions. 9. Graph. 10. Cryptography. 11. Algorithms and Complexity 12. Preparation for the exam. Challenges.
Procedure for assessment of knowledge and competences
Applicable decimal grading scale and the cumulative assessment: Final evaluation = CW*0.5 + E *0.5, here CW - control works, E - exam.
Main literature
1. Rosen, K. H. (2012) *Discrete Mathematics and Its Applications*. Seventh Edition. Published by McGraw-Hill, 2. Dičiūnas, V., Skersys, G. (2003). Diskrečioji matematika / *Discrete Mathematics*. Mokymo priemonė. Vilnius,. 3. Krylovas, A. (2009) Diskrečioji matematika. / *Discrete Mathematics.*Vilnius, Technika, 302 p. 4. Lassaigne, R., de Rougemont M.(1996) Logika ir informatikos pagrindai. / *Logic and Computer Basics*. Vilnius, Žodynas. 5. Lassaigne, R., de Rougemont, M. (1999) Logika ir algoritmų sudėtingumas. / *The logic and algorithm complexity*. Vilnius, Žara. 6. Norgėla, S. (2007) Logika ir dirbtinis intelektas. / *The logic and artificial intelligence*. TEV, Vilnius.