

Subject code	Credits
INFN2001	4

Course title in Lithuanian

ALGORITMŲ ANALIZĖ

Course title in English

ALGORITHM ANALYSIS

Short course annotation in Lithuanian (up to 500 characters)

Kurse supažindinama su algoritmais, kurie naudojami sudėingesnių algoritmų kūrimui, grafų teorija, grafų algoritmais, algoritmų sudėtingumu, baigtinių automatų teorija, Tiuringo mašina, universalia Tiuringo mašina ir jų taikymo procesų modeliavimui.

Short course annotation in English (up to 500 characters)

Course introduces algorithms that are used as building blocks for bigger algorithm construction, graph theory and algorithms on graphs, algorithm complexity, finite automata theory, Turing machine and universal Turing machine and their application for modelling of computational processes.

Prerequisites for entering the course

Undergraduate courses: Mathematics, Programming technologies, .NET data structures

Course aim

To introduce the basics for algorithm construction, graph theory, algorithm complexity, finite automata theory and Turing machine as well as their application for modelling of computational processes.

Content

No	Content (topics)
1.	Graphs and their visualization. Pseudo-code of algorithms and its interpretation.
2.	Width-first and depth-first search in graphs.
3.	Paths and spanning trees in graphs. Shortest paths and shortest spanning trees.
4.	Euler and Hamilton cycles in graphs. Other graph theory problems.
5.	Complexity of algorithms. Complexity of graph problems.
6.	Brute force problems' complexity assessment. Complexity of recurrent algorithms.
7.	P, NP and NP-Complete complexity classes.
8.	Finite automata and computational process modelling
9.	Turing machine and its usage in computational process modelling

Distribution of workload for students (contact and independent work hours)

Lectures	30 hours
Laboratory work	30 hours
Individual students work	50 hours
Total:	110 hours

Structure of cumulative score and value of its constituent parts

Final written exam (50%), mid-term written exam (20%), and assessments of laboratory (practical) work (30%).

Recommended reference materials

No.	Publication year	Authors of publication and title	Publishing house	Number of copies in		
				University library	Self-study rooms	Other libraries
<i>Basic materials</i>						
1.	2002	K.Plukas, E.Mačikėnas, B.Jarašiūnienė, I.Mikuckienė. Taikomoji diskrečioji matematika	Technologija	5	3	
<i>Supplementary materials</i>						
1.	2002	T.H. Cormen, C.E. Leiserson, R.L. Rivest, C. Stein. Introduction to Algorithms	MIT Press			
2.	1967	T.L. Booth. Sequential Machines and Automata Theory	John Willey & Sons			

Course programme designed by

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