RĪGAS TEHNISKĀ
UNIVERSITĀTE

RTU Course "Introduction to Computers and Algorithms"
13107 null

General data

Code	RTR107
Course title	Introduction to Computers and Algorithms
Course status in the programme	Courses of Free Choice
Responsible instructor	Aleksandrs Ipatovs
Academic staff	Jānis Klūga
Volume of the course: parts and credits points	1 part, 2.0 Credit Points, 3.0 ECTS credits
Language of instruction	LV, EN
Annotation	The study course provides knowledge about computers structure and operation principles. Following topics are covered: counting systems and data storage in computer memory, concept of algorithm, types of algorithm notation, linear, branched and cyclic algorithms, implementation of basic algorithms in Python programming language, text editors for preparing texts and programs, debugging and execution of programs.
Goals and objectives of the course in terms of competences and skills	The aim of the study course is to give and develop knowledge about structure of computers and data storage in computer memory, to provide students with basics of algorithmization and their implementation in the programming language Python. Tasks of the study course: - to provide basic knowledge of computer structure and principles of operation; - to explain basic principles of algorithmization and types of algorithm notation; - to develop skills to compare efficiency of different algorithms; - to develop skills to use the programming language Python for programming of various algorithms.
Structure and tasks of independent studies	Independent survey on literature. Studying of additional material on Python programming language operators and functions in electronic form. Preparing for the test and practical works.
Recommended literature	Obligātā/Obligatory: 1.M. Lassoff, "Introduction to Python 2018 edition", 2018. 2.P. Wentworth, J. Elkner, A. B. Downey and C. Meyers, "How to Think Like a Computer Scientist: Learning with Python 3", 2012 3.T. H. Cormen, C. E. Leiserson, R. L. Rivest, C. Stein, "Introduction to Algorithms, 3rd Edition" The MIT Press, 2016. Papildu/Additional: 1.Praktisko darbu apraksti ORTUS mācību vidē. / Descriptions of the practical works in ORTUS learning environment.
Course prerequisites	Secondary school informatics course knowledge.

Course contents

Content	Full- and part-time intramural studies		Part time extramural studies	
	Contact Hours	Indep. work	Contact Hours	Indep. work
Review of modern Computers. Computer structure and operating principles.	6	6	0	0
Numeral systems. Transformation of numbers between numeral systems.	6	6	0	0
The concept of algorithm. Types of algorithm notation.	4	4	0	0
Linear, branched and cyclic algorithms.	5	5	0	0
Implementation of basic algorithms in Python programming language.	10	10	0	0
Program debugging and execution.	3	3	0	0
Data input/output options. Basics of programming techniques. Modularity of the program.	6	6	0	0
Total:	40	40	0	0

Learning outcomes and assessment

Learning outcomes	Assessment methods
Understands the basics of computer structure and operating principles.	Complete and defend practical works. Test.
Can convert numbers from one numeral system to another.	Complete and defend practical works. Test.
Understands different types of algorithm notation. Can implement basic algorithms in Python programming language.	Complete and defend practical works. Test.
Is able to design a program in Python programming language, debug and execute it.	Complete and defend practical works. Test.

Evaluation criteria of study results

Criterion	%
Tests	40
Practical works	60

			Total:	100

Study subject structure

Part	CP	Hours per Week			Tests			Tests (free choice)		
		Lectures	Practical	Lab.	Test	Exam	Work	Test	Exam	Work
1.	2.0	0.0	1.0	1.0	*					