

Study Programme: Information Technologies		
Course Unit Title: Data Structure and Algorithms 1		
Course Unit Code: IT102		
Name of Lecturer(s): Vladimir Kurbalija		
Type and Level of Studies: Bachelor Academic Degree		
Course Status (compulsory/elective): Compulsory		
Semester (winter/summer): Summer		
Language of instruction: Serbian (primary), English (secondary)		
Mode of course unit delivery (face-to-face/distance learning): Face-to-face		
Number of ECTS Allocated: 7		
Prerequisites: None		
Course Aims: The objective of the course is to enable the students to understand and use dynamic data structures.		
Learning Outcomes: <i>Minimum:</i> At the end of the course, it is expected that a successful student is able to realize a basic dynamic data structure using pointers/references. <i>Desirable:</i> At the end of the course, it is expected that a successful student is able to identify a suitable data structure for solving a problem and implement it using pointers/references where applicable.		
Syllabus: <i>Theory</i> Basic concepts of programming languages needed for efficient programming of data structures and algorithms. The definition of abstract data types. Various criteria for implementing data types. Algorithm efficiency and complexity score. Abstract data type LIST. Implementation of a list and basic operations with a list. Circular lists, use of headers and limiters. Multiply linked lists. Abstract data types stack and queue. Various implementations of stack and queue. <i>Practice</i> Implementation of various data structures (list, stack, queue...). Typical applications of the presented algorithms, algorithmic techniques and abstract data types.		
Required Reading: 1. Đura Paunić, Data Structures and Algorithms, University of Novi Sad, Faculty of Sciences, University book, Novi Sad, 1997. 2. Michael T. Goodrich, Roberto Tamassia and Michael H. Goldwasser. Data structures & algorithms in Java, Sixth edition. Wiley. 2014. 3. Vladimir Kurbalija, Miloš Radovanović, Doni Pracner, Zbirka zadataka iz predmeta Strukture podataka i algoritmi 1, Prirodno-matematički fakultet, 2014		
Weekly Contact Hours: 5	Lectures: 2	Practical work: 3
Teaching Methods: Classical methodology is applied during lectures. The basic dynamic data structures are explained and illustrated by examples. During theoretical and practical exercises the programming language Java is used to implement data structures and practical examples of their use. The knowledge of students is tested during the exercises through four practical tests,		

which cover the materials that were presented. At the oral part of examination students demonstrates their understanding of data structures and algorithms on them.

Knowledge Assessment (maximum of 100 points): 100

Pre-exam obligations	points	Final exam	points
Active class participation		written exam	
Practical work	60	oral exam	40
Preliminary exam(s)		
Seminar(s)			

The methods of knowledge assessment may differ; the table presents only some of the options: written exam, oral exam, project presentation, seminars, etc.