

Study programme(s): Teaching Informatics, Informatics (IM)				
Level: master				
Course title: Data Structures and Algorithms 3 (code IA021)				
Lecturer: Đura Ž. Paunić				
Status: obligatory in study programme "Informatics" - module <i>Computer Science</i> ; elective in other modules of study programme <i>Informatics</i> and study programme "Teaching Informatics"				
ECTS: 7				
Requirements: Data Structures and Algorithms 2				
Learning objectives Students learn to understand and use data structures graph and tree.				
Learning outcomes <i>Minimal:</i> Students are expected to implement different types of trees and graphs. <i>Optimal:</i> Students are expected to implement different types of trees and graphs and recognize desirable structure for problem solving. It is expected that student is able to modify those structures and adjust them for practical applications.				
Syllabus <i>Theory</i> Abstract data type tree and its implementations. Tree traversals. Search tree. Balanced search tree and its analysis. Different types of balanced tree (AVL-tree, B-tree, red-black tree, etc.) Other kinds of trees. Modifications of standard tree implementations. Abstract data type graph and its implementations. Basic graph implementations. Graph traversals (depth-first search, breath-first search). Applications. Modifications of standard graph implementations. <i>Practice</i> Implementations of data structures tree and graph and their different applications and modifications.				
Literature Đura Paunić: <i>Data Structures and Algorithms</i> , University of Novi Sad, Faculty of Sciences, Novi Sad, 1997, University book				
Weekly teaching load				Other: 0
Lectures: 2	Exercises: 3	Other forms of teaching: 0	Student research: 0	
Teaching methodology Classical methodology is applied in lectures. Implementations of data structures tree and graph are explained and illustrated with appropriate examples. Students' knowledge is checked in three tests. Modula-2 programming language is used on exercises to implement tree and graph and their applications. Students' knowledge is tested in two colloquia that use different data types. At the oral exam, students show understanding of data structures and algorithms with those structures.				
Grading (maximum number of points 100)				
Pre-exam obligations	Points	Final exam		points
Colloquia	30	oral exam		50
Seminar	20			