

Discipline	ALGORITHMS AND DATA STRUCTURES code: 08 summer semester		
Specialty	Computer Systems and Technologies		
ECTS credits: 7	Form of assessment: exam		
Lecturer	Ass. Prof. Neli Kalcheva, PhD Room 404A TB Phone: +359 52 383 628 E-mail:		
Department	Software and Internet Technologies		
Faculty	Faculty of Computing and Automation		
<p>Learning objectives:</p> <p>The course is created for a first year students on Computer Science and Technology. The course emphasis is on designing and analyzing of algorithms. Also fundamental data structures and its implementations are considered. The course forms knowledge and skills in the fields of correct and efficient programs and algorithms synthesis. It covers a range of important programming techniques and abstract data types (ADT).</p> <p>At the end of the course, students understand date structures. They know how to use them, how to implement them several ways. The students can reason about efficiency with a big-<i>O</i> analysis and argue for the correctness of their implementations by referring to the invariant of the ADT. Another important effect of the course is the specification, design, and implementation experience.</p>			
CONTENTS:			
	Training Area	Hours lectures	Hours seminar exercises
	Algorithms and its basic features, definitions, efficiency, correctness and so on.	6	6
	Methods and approaches for algorithm's and program's design (such as structure programming, object oriented programming, recursion, backtracking, "divide and conquer" approach and so on).	8	8
	Structures of data, static and dynamic, linear and non-linear (such as stack, queues, double ended queues, lists, trees and graphs).	8	8
	Well-known classical algorithms. This part of the course includes such topics as algorithms for sorting, searching and hashing, heuristic and greedy algorithms, probabilistic and randomized algorithms, genetic algorithms etc.	8	8
	TOTAL: 60 h	30	30