DATA STRUCTURES AND ALGORITHMS

Title of Study Programme and Code	Type (compulsory/optional)	Cycle	Year of study when the component is delivered (if applicable)
Information Systems Engineering 6531EX043	Compulsory		1st year
Semester/trimester when the component is delivered	**Number of ECTS credits allocated**	**Language of instruction**	**Mode of delivery (face-to-face/e-learning/…)**
2nd	4 ECTS	English	

Learning outcomes		Study methods	Assessment methods
After completion of the study subject, a student should be able to:		Lectures; Analysis of information sources; Individual practical works.	Assessment of practical works; Exam.
LO 1	Know the basic structures of data and will be able to use them;		
LO 2	Know the rules of algorithm creation and the most popular algorithm rendering types.		
LO 3	Read, explain and write algorithms.		
LO 4	Understand and use the concepts, theory and practice of data structures and algorithms to solve specific problems.		
LO 5	Independently apply data structures and key algorithms to process data sets.		
LO 6	Select and apply classic algorithms for specific tasks.		

Prerequisites
(these courses must be sucessfully completed prior to taking this particular course)

Fundamentals of Technomathematics, Information Technologies and Programming Fundamentals.

Course content

1. Data, data structures, abstract data types;
2. Storage of data in memory. The simplest types of data: arrays, sets, records;
3. Linked lists, stack, rows;
4. Hierarchical Data Structures: tree, binary tree, binary search tree;
5. Algorithms, their types, rendering;
6. Sorting and search algorithms;
7. Algorithm analysis.

Recommended or required reading and other learning resources/tools

1. John Bullinaria. Data Structures and Algorithms:

http://www.cs.bham.ac.uk/~jxb/DSA/dsa.pdf
2. Data Structures Using C: http://www.academictutorials.com/data-structure/
3. Mark Allen Weiss. Data Structures and Algorithm Analysis in C++ : http://iips.icci.edu.iq/images/exam/DataStructuresAndAlgorithmAnalysisInCpp_2014.pdf
4. Michael T. Goodrich, Roberto Tamassia, David M. Mount. Data Structures and Algorithms in C++: https://o6ucs.files.wordpress.com/2012/11/data-structures-and-algorithms-in-c.pdf