ERASMUS+
EU programme for education, training, youth and sport

Incoming student mobility

Name of UNIOS University Unit: SCHOOL OF APPLIED MATHEMATICS AND INFORMATICS

COURSES OFFERED IN FOREIGN LANGUAGE FOR ERASMUS+ INDIVIDUAL INCOMING STUDENTS

Department or Chair within the UNIOS Unit	School of Applied Mathematics and Informatics

Study program	• Undergraduate university study programme in Mathematics and Computer Science • Undergraduate university study programme in Mathematics

Study level	Undergraduate (Bachelor)

Course title	Data Structures and Algorithms I
Course code	I053
Language of instruction	English
Brief course description	Syllabus. 1. Introduction. Basic terms and definitions. Design and analysis of algorithms. Example: Insertion sort and Merge sort. 2. Asymptotic notation. Recurrences. The substitution method for solving recurrences. The recursion-tree method for solving recurrences. The master method for solving recurrences. 3. Divide-and-Conquer. Binary search. The algorithm for efficient exponentiation. Strassen's algorithm for matrix multiplication. 4. Randomized algorithms. 5. Sorting algorithms and Order Statistics. Bubble sort. Heapsort. Quicksort. A randomized version of quick sort. Sorting in linear time. Order statistics. 6. Elementary Data Structures. Stacks and queues. Linked lists. Trees. Hash tables and associative arrays. 7. Binary Search Trees. Querying a binary search tree. Insertion and deletion. 8. Priority Queues. 9. Greedy Algorithms. Elements of greedy strategy. Applications in different computational problems. 10. Dynamic Programming. Elements of dynamic programming. Applications in different computational problems. 11. Amortized Analysis.

Form of teaching	Consultative teaching.
Form of assessment	Lectures contain a deep and systematic overview of elementary data structures and algorithms. During exercises students are expected to solve given programming problems by using acquired knowledge. The correctness and time and space complexity of implemented algorithms are the most important elements. At the end of each practice session students individually solve short quizzes. During the semester, students solve homework assignments that contain programming problems. The assessment of theoretical knowledge is done by written examinations. If students achieve satisfactory results in homework and written exams, they are not obliged to take final written and oral exams.
Number of ECTS	7
Class hours per week	3+2+0
Minimum number of students	
Period of realization	Winter semester
Lecturer	Domagoj Matijević