

1.	Field of study	Computer Science
2.	Academic year of entry	2017/2018 (summer term), 2018/2019 (summer term)
3.	Level of qualifications/degree	second-cycle studies
4.	Degree profile	general academic
5.	Mode of study	full-time

Module: Advanced algorithm and data structures

Module code: 08-IN-S2-ZAiSD

1. Number of the ECTS credits: 5

2. Learning outcomes of the module			
code	description	learning outcomes of the programme	level of competence (scale 1-5)
ZAiSD -K_10	Is aware of substantial importance of algorithm features (complexity, correctness) on which there are components constructed (modules, functions, procedures) of bigger software systems for final efficiency, operation correctness and security of these systems.	K_2_A_I_K01 K_2_A_I_K06	1 1
ZAiSD -U_6	Can designate computational complexity of recurrent algorithms and record their complexity , e.g. in the form of recurrent equation and solve such an equation.	K_2_A_I_U01 K_2_A_I_U07 K_2_A_I_U08	1 1 1
ZAiSD -U_7	Can choose and implement an appropriate, basic or advanced paradigm of algorithm construction for solution of a given problem. Can justify his choice.	K_2_A_I_U13 K_2_A_I_U16	4 1
ZAiSD -U_8	Can choose and implement an appropriate text algorithm for a given problem taking into account requirements as to search time and memory consumption.	K_2_A_I_U13 K_2_A_I_U16	4 1
ZAiSD -U_9	Can choose and implement an appropriate algorithm for a given graph problem and design sufficient data structure representing problem modeling graph.	K_2_A_I_U13 K_2_A_I_U16	4 1
ZAiSD -W_1	Has knowledge in the field of advanced methods of determining the computational complexity of algorithms. Knows and understands classes of algorithms complexity.	K_2_A_I_W02 K_2_A_I_W03	1 2
ZAiSD -W_2	Has knowledge in the field of advanced paradigms of algorithms constructing, among others: exhaustive search, greedy strategies. Knows and understands basics of operation and advantages and disadvantages of these algorithms.	K_2_A_I_W09	4
ZAiSD -W_3	Has knowledge in the field of graph algorithms.	K_2_A_I_W02 K_2_A_I_W09	1 4

ZAiSD -W_4	Has knowledge in the field of text algorithms.	K_2_A_I_W09	4
ZAiSD -W_5	Has knowledge in the field of approximation algorithms.	K_2_A_I_W09	4

3. Module description	
Description	Aim is to introduce the student into advanced issues of algorithms, data structures and techniques of designing algorithms.
Prerequisites	

4. Assessment of the learning outcomes of the module			
code	type	description	learning outcomes of the module
ZAiSD _w_1	Written exam	Verification of knowledge basing on content presented during lectures. Exam is composed of open theoretical questions and at least two tasks of content.	ZAiSD -K_10, ZAiSD -U_6, ZAiSD -W_1, ZAiSD -W_2, ZAiSD -W_3, ZAiSD -W_4, ZAiSD -W_5
ZAiSD _w_2	Reports credit	Elaborating reports in writing and their verbal crediting in a fixed time as a verification of skills acquired while problem solving.	ZAiSD -K_10, ZAiSD -U_6, ZAiSD -U_7, ZAiSD -U_8, ZAiSD -U_9

5. Forms of teaching						
code	form of teaching			required hours of student's own work		assessment of the learning outcomes of the module
	type	description (including teaching methods)	number of hours	description	number of hours	
ZAiSD _fs_1	lecture	Presenting educational content in verbal form with use of audio-visual aids and other written education aids. Focusing on issues difficult to understand and these with deeper theoretical bases. Elicitation of students by asking questions concerning presented content.	30	Exam preparation.	30	ZAiSD _w_1
ZAiSD _fs_2	laboratory classes	Detailed preparation of the students for solving tasks indicating proceeding methodology and proceedings sequence.	30	Laboratory class preparation. Individual solution of tasks given during the laboratory class, elaboration of reports.	60	ZAiSD _w_2