1.	**Field of study**	**Computer Science**
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2021/2022 (summer term), 2022/2023 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	part-time

Module: Techniques for optimizing computer programs

Module code: W4-IN-N2-20-F-TOPK

1. Number of the ECTS credits: 4

2. Learning outcomes of the module

code	description	learning outcomes of the programme	level of competence (scale 1-5)
M_001	Has knowledge of the ways in which computations are made in modern computers and how they impact the overall computation time.	K_K01 K_U05 K_U09 K_W02	1 1 1 1
M_002	Has knowledge of programming techniques and tools that allow better use of the computing power offered by modern computers.	K_U01 K_U09 K_W02 K_W03 K_W04	1 1 1 1 1
M_003	Is able to use tools that facilitate diagnostics of performance-related problems in computer programs.	K_U01 K_U05 K_W02 K_W03	1 1 1 1
M_004	He can choose algorithms and data structures to improve the efficiency of computations.	K_U05 K_U09 K_W02 K_W04	1 1 1 1

3. Module description	
Description	The module aims to familiarize students with methods of optimizing the performance of computer programs. Both programming tools and algorithmic solutions will be discussed, taking into account the architecture of modern computers.
Prerequisites	

4. Assessment of the learning outcomes of the module

code	type	description	learning outcomes of the module
W_001	Final test.	Students are tested on the knowledge gained during lectures and laboratory classes. The test consists of a number of closed and (optionally) open questions.	M_001, M_002, M_004
W_002	Midterm test.	At least one test assessing the knowledge gained by students during laboratory classes.	M_001, M_002, M_003, M_004
W_003	Programming assignment.	Optional programming assignments verifying the skills acquired during the course.	M_001, M_002, M_003, M_004

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	
Z_001	lecture	Presentation of the course material in spoken and written forms, supplemented with multimedia content. Emphasizing issues that are more difficult to understand and have deeper theoretical foundations. Engaging listeners by asking questions about the content presented.	15	Reading recommended books and articles. Analysis and repetition of lecture content. Preparation for the final test.	30	W_001, W_002, W_003
Z_002	laboratory classes	Preparation of students to apply the knowledge in programming practice through the presentation of sample programs and programming tools. Discussion of methodology with indication of key steps for the detection, analysis and resolution of performance problems in computer programs.	30	Working on assignments. Studying the recommended literature.	45	W_002, W_003