

**Subject card**

<b>Subject name and code</b>	Theoretical basis of computer science, PG_00143809						
<b>Field of study</b>	Informatics						
<b>Date of commencement of studies</b>	October 2024	<b>Academic year of realisation of subject</b>			2025/2026		
<b>Education level</b>	Bachelor's studies	<b>Subject group</b>			Obligatory subject group in the field of study		
<b>Mode of study</b>	part-time studies	<b>Mode of delivery</b>			at the university		
<b>Year of study</b>	2	<b>Language of instruction</b>			Polish polish		
<b>Semester of study</b>	4	<b>ECTS credits</b>			3.0		
<b>Learning profile</b>	academic	<b>Assessment form</b>			exam		
<b>Conducting unit</b>							
<b>Name and surname of lecturer (lecturers)</b>	<b>Subject supervisor</b>		dr Andrzej Borzyszkowski				
	<b>Teachers</b>		dr Andrzej Borzyszkowski				
<b>Lesson types</b>	<b>Lesson type</b>	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	<b>Number of study hours</b>	20.0	0.0	0.0	0.0	0.0	20
	E-learning hours included: 0.0						
<b>Learning activity and number of study hours</b>	<b>Learning activity</b>	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	<b>Number of study hours</b>	20		0.0		55.0	75
<b>Subject objectives</b>	The aim of the course is to familiarize students with the theoretical foundations of computer science - automata, languages and the basics of computational complexity.						
<b>Learning outcomes</b>	<b>Course outcome</b>		<b>Subject outcome</b>		<b>Method of verification</b>		
	[INFL3_W03] has structured, theoretically grounded general knowledge in the field of algorithms and data structures, formal languages, automata theory and computational complexity, and artificial intelligence		knows the basics of formal languages knows definitions and examples of regular expressions, finite automata, context-free grammars, stacked automata, Turing machines knows Chomsky's hierarchy knows the definition and examples of decidable and undecidable problems		[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion		
	[INFL3_U03] can design and analyze algorithms for their correctness and computational complexity using appropriate algorithmic techniques and data structures		is able to analyze known algorithms in terms of their computational complexity		[SU4] test/exam - oral or written [SU8] observation of student's independent or team work		
	[INFL3_U01] can apply mathematical knowledge to formulate, analyze and solve problems related to computer science		can determine the class of formal languages can prove that a language belongs to a selected class can apply acquired knowledge to determine the decidability of simple problems		[SU8] observation of student's independent or team work		

Subject contents	<ol style="list-style-type: none"> <li>1. Finite automata, regular expressions, non-deterministic automata, equivalence of regular expressions and finite automata.</li> <li>2. Regular expressions in scripting languages.</li> <li>3. Chomsky's hierarchy. Context-free grammars, automata with stack, derivation trees, parsers.</li> <li>4. Turing machine as a model of computation. The concept of computability.</li> <li>5. Computational complexity.</li> <li>6. Class P and NP. NP-complete problems.</li> </ol>		
Prerequisites and co-requisites	no requirements		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	test	51.0%	60.0%
	homework	0.0%	20.0%
	activity on lectures	0.0%	20.0%
Recommended reading	Basic literature	Hopcroft, Ullman, Wprowadzenie do teorii automatów, języków i obliczeń J. Jędrzejowicz, A. Szepietowski, Języki, automaty, złożoność obliczeniowa Wyd. UG 2008	
	Supplementary literature	no applicable	
	eResources addresses		
Example issues/ example questions/ tasks being completed	no applicable		
Work placement	Not applicable		

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