

Subject card

Subject name and code	Advanced programming languages, PG_00143953						
Field of study	Informatics						
Date of commencement of studies	October 2025		Academic year of realisation of subject		2025/2026		
Education level	Master's studies		Subject group		Obligatory subject group in the field of study Subject group related to scientific research in the field of study		
Mode of study	full-time studies		Mode of delivery		at the university		
Year of study	1		Language of instruction		Polish		
Semester of study	1		ECTS credits		7.0		
Learning profile	academic		Assessment form				
Conducting unit	Institute of Informatics -> Faculty of Mathematics, Physics and Informatics -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Wiesław Pawłowski				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	30.0	0.0	0.0	60
	E-learning hours included: 0.0						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	Number of study hours	60		0.0		115.0	175
Subject objectives	The purpose of the course is to familiarize the student with the advanced mechanisms found in modern programming languages and their correct and effective use.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[INFMU2_W06] is well acquainted with the principles of health and safety in the IT profession		is able to use the essential elements and tools of the development environment		[SW5] implementation of a problem task		
	[INFMU2_U03] designs, analyzes for correctness and computational complexity, and builds algorithms using advanced programming techniques and data structures		knows how to solve programming problems using learned programming methods, tools and paradigms		[SU4] test/exam - oral or written		
	[INFMU2_W03] has in-depth knowledge of programming paradigms and advanced programming constructs; knows current trends in programming languages		knows and can use the most important mechanisms of pure functional programming and selected approaches to parallel and asynchronous programming languages		[SW4] test/exam - oral or written		
	[INFMU2_K01] knows the limits of his own knowledge and understands the need for further learning		takes a systematic approach to solving programming problems		[SK5] implementation of a problem task		
	[INFMU2_K03] is able and ready to formulate opinions on basic IT issues		has his own opinion on relevant IT issues and recognizes the potential limitations of his own knowledge in this area		[SK5] implementation of a problem task		
Subject contents	• Application development using hybrid programming methods based on the object-functional approach. • Creating parallel and distributed systems based on the actor model.						

Prerequisites and co-requisites	• Familiarity with basic programming concepts and constructs of object-oriented languages, such as methods, classes, inheritance. • Familiarity with the Java virtual machine environment (JRE/JDK) and related tools. • Ability to proficiently navigate Windows and Linux operating system environments.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	oral exam	51.0%	20.0%
	programming colloquia	51.0%	80.0%
Recommended reading	Basic literature	• M. Odersky, L. Spoon, B. Venners, F. Sommers, Programming in Scala, Fifth Edition, Artima Press, 2021. • F. Lopez-Sancho, Akka in Action, Second Edition, Manning 2023	
	Supplementary literature	• M. Pilquist, R. Bjarnason, P. Chiusano, Functional Programming in Scala, Second Edition, Manning 2023	
	eResources addresses		
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

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