



## Subject card

Subject name and code	Programming languages, PG_00045303						
Field of study	Data Engineering						
Date of commencement of studies	October 2022	Academic year of realisation of subject			2023/2024		
Education level	first-cycle 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	2	Language of instruction			English		
Semester of study	3	ECTS credits			2.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Algorithms and Systems Modelling -> Faculty of Electronics, Telecommunications and Informatics						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Piotr Mironowicz				
	Teachers		dr inż. Piotr Mironowicz				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	0.0	0.0	30
	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	30		4.0		16.0	50
Subject objectives	The aim of the course is an introduction to popular programming paradigms and getting the skill of their practical implementations.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_W05] Knows and understands programming models and evolution of related languages. Knows the methods of analysing and designing information systems and the modeling languages used in them, as well as the basic object-oriented programming platforms.		Student knows important (conceptually and historically) programming languages like Modula, Ada, Smalltalk, Haskell and Prolog.		[SW1] Assessment of factual knowledge		
	[K6_U01] programs in procedural, object, functional and logic programming languages, codes programs at the processor instruction level, runs and tests programs.		Student is able to program in languages of paradigms: procedural and object (Modula, Smalltalk), functional (Haskell), and logics (Prolog).		[SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment		

## Subject contents

1. Procedural programming.
2. Linear syntax. FORTRAN
3. Activation records and subroutines
4. Recursive procedure call.
5. Block syntax. Control flow abstraction.
6. Binding of the names with objects. Range bonds.
7. The parameters of the procedure call.
8. Activation records for languages with recursion.
9. Static and dynamic calls. ALGOL. PASCAL.
10. Restrictions of block languages.
11. Abstraction of data and access protection.
12. Modularization. Modula-2. ADA83, ADA95
13. Exceptions. Exception handling models.
14. Concurrent procedures. Rendezvous.
15. Object-oriented programming. Objects, classes, hierarchies.
16. Dynamic types. Polymorphism. Smalltalk. C + +.
17. Recursive interpreted commands.
18. Symbolic transformation. Tail recursion.
19. Functional programming paradigm.
20. Haskell. Basic constructions and operations, module creation, performance.
21. Tacit programming.
22. LISP. General outline.
23. Prolog as an example of programming in logic.
24. Defining languages. Chomsky's classification, compilers.
25. Monads.

Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	tests	50.0%	40.0%
	project	50.0%	60.0%
Recommended reading	Basic literature	<p>1. S. Mangano: XSLT receptury, wyd.2, Helion 2007</p> <p>2. Cincom Smalltalk Downloads, <a href="http://www.cincomsmalltalk.com/">http://www.cincomsmalltalk.com/</a></p> <p>3. SAXON - The XSLT and XQuery Processor, <a href="http://saxon.sourceforge.net/">http://saxon.sourceforge.net/</a></p> <p>4. W.F. Clocksin, W.F., Mellish, C.S.: Prolog Programowanie. Helion 2003</p> <p>5. Ada Programming, <a href="http://en.wikibooks.org/wiki/Ada">http://en.wikibooks.org/wiki/Ada</a></p> <p>6. SWI-Prolog downloads, <a href="http://www.swi-prolog.org/download.html">www.swi-prolog.org/download.html</a></p> <p>7. ADA Core, the GNAT Pro Company, <a href="http://www.adacore.com/home">http://www.adacore.com/home</a>, <a href="https://libre.adacore.com/">https://libre.adacore.com/</a></p> <p>8. D. S. Touretzky: Common Lisp: A Gentle Introduction to Symbolic Computation,  <a href="http://www.cs.cmu.edu/~dst/LispBook/">http://www.cs.cmu.edu/~dst/LispBook/</a></p> <p>9. Z. Huzar, Z. Fryźlewicz, I. Dubielewicz, B. Hnatk: Ada 95, Helion 1998</p> <p>10. Polski serwis języka Smalltalk, <a href="http://www.objectspace.net/">http://www.objectspace.net/</a></p>	
	Supplementary literature	<a href="http://en.wikipedia.org/wiki/Programming_paradigm">http://en.wikipedia.org/wiki/Programming_paradigm</a>	
	eResources addresses		
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		