



Subject card

Subject name and code	Object-oriented programming, PG_00054485						
Field of study	Automation, Robotics and Control Systems						
Date of commencement of studies	February 2024	Academic year of realisation of subject			2024/2025		
Education level	second-cycle studies	Subject group					
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	2	Language of instruction			Polish		
Semester of study	3	ECTS credits			4.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Faculty of Electrical and Control Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Paweł Kowalski					
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	15.0	15.0	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	12.0		28.0	100	
Subject objectives	Understanding the concepts of object-oriented programming. Acquiring the skills of object modelling, solving problems using objects and relations between them. Acquiring the ability to build and run Java, Python and Kotlin programs with object-oriented programming methods. Acquisition of the ability to design and build a graphical user interface.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	K7_U07	Analyzes the operation of a selected website in terms of the data it provides. Designs and builds a web crawler to retrieve data from the website.			[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools [SU5] Assessment of ability to present the results of task		
	K7_W06	Designs and builds a web crawler			[SW2] Assessment of knowledge contained in presentation [SW3] Assessment of knowledge contained in written work and projects		
	K7_U04	Works independently looking for solutions to the problems encountered in the documentation and on internet forums. Identifies and removes the causes of application malfunctions. Gathering the information necessary to complete the project.			[SU1] Assessment of task fulfilment [SU3] Assessment of ability to use knowledge gained from the subject [SU5] Assessment of ability to present the results of task		
	K7_W11	Designs and builds applications with a graphical user interface.			[SW2] Assessment of knowledge contained in presentation [SW3] Assessment of knowledge contained in written work and projects		
	K7_U03	Presents their own solutions to laboratory tasks and developed applications.			[SU1] Assessment of task fulfilment [SU5] Assessment of ability to present the results of task		

Subject contents	<p>Lecture:</p> <p>Introduction to object oriented programming and Java. Java data types. Support for standard input and output. Classes and objects. Defining a class and an object. Definitions of fields, methods and constructors. The life cycle of objects and the garbage collector mechanism. Access modifiers visibility of class members. Data Hermetization. Operations on arrays. Inheritance and polymorphism. File handling. Catching, handling and throwing exceptions. Building a GUI application. The essence of event programming. Designing and building mobile applications using the Kotlin language. Data acquisition using an Internet robot.</p> <p>Laboratory:</p> <p>During laboratory sessions, the knowledge presented in lectures is practically applied. The laboratories provide an introduction to object-oriented programming techniques in Java, with tasks designed to reinforce key concepts essential for project implementation.</p> <p>Project:</p> <p>Development of a system consisting of a graphical user interface application, a web scraper, and a mobile application.</p>														
Prerequisites and co-requisites	Basic programming skills														
Assessment methods and criteria	<table border="1"> <thead> <tr> <th data-bbox="456 893 794 922">Subject passing criteria</th> <th data-bbox="799 893 1137 922">Passing threshold</th> <th data-bbox="1142 893 1469 922">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="456 929 794 958">project</td> <td data-bbox="799 929 1137 958">50.0%</td> <td data-bbox="1142 929 1469 958">45.0%</td> </tr> <tr> <td data-bbox="456 965 794 994">exam</td> <td data-bbox="799 965 1137 994">50.0%</td> <td data-bbox="1142 965 1469 994">40.0%</td> </tr> <tr> <td data-bbox="456 1001 794 1030">laboratory tasks</td> <td data-bbox="799 1001 1137 1030">50.0%</td> <td data-bbox="1142 1001 1469 1030">15.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	project	50.0%	45.0%	exam	50.0%	40.0%	laboratory tasks	50.0%	15.0%
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Recommended reading	Basic literature	<ul style="list-style-type: none"> • B. Eckel, Thinking in Java, Helion. • Java Programming Language, Decodejava , https://www.decodejava.com. • S. Ludwiczak, M. Kunert: Kurs Programowania Java od Podstaw. https://javastart.pl/baza-wiedzy,JavaStart,2021. • Java Technical Details, http://java.sun.com. 													
	Supplementary literature	<ul style="list-style-type: none"> • C. S. Horstmann, G. Cornell: Java. Techniki zaawansowane. Helion, Gliwice 2009. • A. Redko: Advanced Java Preparing you for Java Mastery, 2015. 													
	eResources addresses	Adresy na platformie eNauczenie:													
Example issues/ example questions/ tasks being completed	<ul style="list-style-type: none"> • Development of a simple expert system. • Implementation of the game of life according to the principles of John Conway. • Designing classes for the passage of a computer game. • Development of a graphic interface for the selected application. • Handling of events generated in the designed graphical interface. • Tic-tac-toe game for mobile devices. • Development of an Internet robot 														
Work placement	Not applicable														

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