



## Subject card

Subject name and code	Object-oriented programming languages III, PG_00020777						
Field of study	Technical Physics						
Date of commencement of studies	October 2021	Academic year of realisation of subject			2023/2024		
Education level	first-cycle studies	Subject group			Optional subject group 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	3	Language of instruction			English		
Semester of study	5	ECTS credits			6.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Zakład Metod Obliczeniowych Fizyki Chemicznej -> Instytut Fizyki i Informatyki Stosowanej -> Faculty of Applied Physics and Mathematics						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Jan Franz				
	Teachers		dr hab. Jan Franz				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	60.0	0.0	0.0	75
	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	75		15.0		60.0	150
Subject objectives	<ul style="list-style-type: none"><li>The students will know about the principle of object oriented programming and how they are realized in Java.</li><li>The students will be able to write object oriented programs using the Java programming language.</li><li>The students will be able to apply concepts, for example exceptions, generics and collections.</li></ul>						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	K6_W05		The students will know about the principle of object oriented programming and how they are realized in Java. The students can make usage of the IDE.		[SW1] Assessment of factual knowledge		
	K6_U03		The students will be able to write object oriented programs using the Java programming language. The students will be able to apply concepts, for example exceptions, generics and collections.		[SU1] Assessment of task fulfilment		
Subject contents	<ol style="list-style-type: none"><li>The Java ecosystem.</li><li>A first look at classes and objects in Java.</li><li>Objects, primitive types, wrapper classes and arrays.</li><li>Inheritance and interfaces.</li><li>Introduction to the collections framework.</li><li>Design patterns.</li><li>Generic classes and methods.</li><li>Collections.</li><li>Additional topics on object oriented design and re-factoring.</li><li>Introduction to Lambda expressions.</li><li>Application of Lambda expressions.</li><li>Exceptions.</li><li>Some useful Java libraries.</li><li>Summary.</li><li>Advanced topics.</li></ol>						
Prerequisites and co-requisites	Object-oriented programming languages 1 and 2						

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	final exam	50.0%	50.0%
	lab credit	50.0%	50.0%
Recommended reading	Basic literature	<ol style="list-style-type: none"> <li>1. J. Bloch, Effective Java, 3rd Edition, Addison-Wesley, 2017</li> <li>2. R.-G. Urma, M. Fusco, A. Mycroft, Modern Java in Action, Manning Publications, 2018</li> <li>3. B. J. Evans, J. Clark, M. Verburg, The Well-Grounded Java Developer, Second Edition, Manning Publications, 2023</li> </ol>	
	Supplementary literature	<ol style="list-style-type: none"> <li>1. C. S. Horstmann, Core Java Volume 1 Fundamentals. 11<sup>th</sup> edition, Prentice Hall, 2018</li> <li>2. C. S. Horstmann, Core Java Volume 2 Advanced Features. 11<sup>th</sup> edition, Prentice Hall, 2018</li> <li>3. H. Schildt, Java: The Complete Reference. 11<sup>th</sup> edition, McGraw-Hill, 2019</li> </ol>	
	eResources addresses	Adresy na platformie eNauczenie: Obiektowe języki programowania III - 2023/24 - Moodle ID: 30986 <a href="https://enauczenie.pg.edu.pl/moodle/course/view.php?id=30986">https://enauczenie.pg.edu.pl/moodle/course/view.php?id=30986</a>	
Example issues/ example questions/ tasks being completed	<p>The computer code of a small class is shown. The class has a method for dividing two numbers. The division by zero is not safe and can cause a program crash.</p> <p>Please write a class <code>DivideByZeroException</code>, which extends the class <code>Exception</code>. Please modify the method so, that it can throw a <code>DivideByZeroException</code>.</p>		
Work placement	Not applicable		