



## Subject card

Subject name and code	Design patterns, PG_00031942						
Field of study	Technical Physics						
Date of commencement of studies	February 2024	Academic year of realisation of subject			2023/2024		
Education level	second-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	1	Language of instruction			Polish		
Semester of study	1	ECTS credits			3.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Theoretical Physics and Quantum Information -> Faculty of Applied Physics and Mathematics						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Bartosz Reichel				
	Teachers		dr inż. Bartosz Reichel				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	30.0	0.0	0.0	45
	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	45		5.0		25.0	75
Subject objectives	The student will know the selected object design patterns, and some connected programming techniques. Will be able to use them in programs.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_W03] Has general knowledge of current development paths and discoveries in the scope of physics and related fields of science and technology.		The student has knowledge of design patterns and is aware of their importance in the modern world.		[SW1] Assessment of factual knowledge		
	[K7_K05] Can communicate and present results of own work and transfer information in a commonly understandable manner.		Student has knowledge of the design patterns and is able to present them on the base of his own project.		[SK3] Assessment of ability to organize work		
Subject contents	<p>Discussed in lectures are creative patterns: Singleton, Factory Method, Prototype, Abstract Factory, Builder, Structural patterns: Proxy, Adapter, Facade, Bridge, Composite, Decorator, Flyweight, and functional patterns: Template Method, Memento, Command, Iterator, Observer, Strategy, State, Visitor. In addition, be submitted to the library collections of the standard C++ and Java, and input / output operations in C++ and Java. The present model is a design pattern Model - View - Coordinator.</p> <p>During the laboratory exercises, students develop software using these techniques.</p>						
Prerequisites and co-requisites	Basic knowledge of programming in C++ and Java. Knowledge of basic algorithms and data structures.						
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	Project		50.0%		100.0%		
Recommended reading	Basic literature		E. Gamma, R. Helm, R. Johnson, J. Vlissides (the Gang of Four) "Design Patterns", Addison-Wesley, 1994				
			B. Eckel "Thinking in Patterns", dostępna za darmo w Internecie				
	Supplementary literature		None				

	eResources addresses	Adresy na platformie eNauzanie:
Example issues/ example questions/ tasks being completed	The project utilizing design patterns	
Work placement	Not applicable	