GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Design of Multilayer and Distributed Applications and Systems, PG_00063895		
Field of study	Informatics		
Date of commencement of studies	October 2025	Academic year of realisation of subject	2028/2029
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	4	Language of instruction	Polish
Semester of study	7	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department Of Computer Architecture -> Faculty Of Electronics Telecommunications And Informatics -> Wydziały Politechniki Gdańskiej		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Jarosław Kuchta	
	Teachers	dr inż. Jarosław Kuchta	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	0.0	30.0	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	3.0	27.0	75

Subject objectives

Acquiring knowledge and skills to design applications running in multitier Internet systems

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W04] knows and understands, to an advanced extent, the principles, methods and techniques of programming and the principles of computer software development or programming devices or controllers using microprocessors or programmable elements or systems specific to the field of study, and organisation of systems using computers or such devices	Knows architecture models internet application systems. Distinguishes architecture multi-layered and multi-stem. Knows the ways to split functions application between client and server. Knows the main design patterns distributed applications. Know principles of main constructions architectural layers.	[SW1] Assessment of factual knowledge
[K6_U04] can apply knowledge of programming methods and techniques as well as select and apply appropriate programming methods and tools in computer software development or programming devices or controllers using microprocessors or programmable elements or systems specific to the field of study	Is able to use knowledge of programming methods and techniques when designing multi-layer and distributed applications and systems.	[SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU1] Assessment of task fulfilment
[K6_U09] can carry out a critical analysis of the functioning of existing technical solutions and assess these solutions, as well as apply experience related to the maintenance of technical systems, devices and facilities typical for the field of studies, gained in the professional engineering environment	Creates project documentation web application or system Internet using known design patterns	[SU3] Assessment of ability to use knowledge gained from the subject [SU1] Assessment of task fulfilment

<table>
<tr><td>Subject contents</td><td>• Modeling and Designing Multi-Tier and Distributed Systems
• Designing the Architecture of a Complex System
• Designing the Logic Layer of a System
• Principles of Designing the User Interface of a Complex System
• Principles of Designing the Data Structure of a Complex System
• Data Layer Design Patterns
• Design Patterns for Passing Data Between Distributed Components
• Service Layer Design Patterns
• Web Application Construction Design Patterns
• Web Application Presentation Layer Design Patterns</td></tr>
<tr><td>Prerequisites and co-requisites</td><td></td></tr>
<tr><td>Assessment methods and criteria</td><td><table><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td>Project documentation</td><td>50.0%</td><td>50.0%</td></tr><tr><td>Exam during semester</td><td>50.0%</td><td>50.0%</td></tr></table></td></tr>
<tr><td>Recommended reading</td><td><table><tr><td>Basic literature</td><td>Andrew S. Tanenbaum, Maarten Van Steen: Distributed Systems: Principles and Paradigms

Core J2EE Pattern Catalog, http://www.corej2eepatterns.com/

Erich Gamma, Richard Helm, Ralph Johnson and John Vlissides: Design Patterns: Elements of Reusable Object-Oriented Software</td></tr><tr><td>Supplementary literature</td><td>Guidelines, Patterns, and code for end-to-end Java applications. http://www.oracle.com/technetwork/java/catalog-137601.html</td></tr><tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:</td></tr></table></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td>• Differences between multilayer and multi-tier web-based system.
• Ways to ensure the scalability of web applications running in the multitier system.
• Design patterns used in the construction of web applications</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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