

Subject card

Subject name and code	Programming Distributed Applications, PG_00155057						
Field of study	Information Science and Econometrics						
Date of commencement of studies	October 2024		Academic year of realisation of subject		2025/2026		
Education level	undergraduate studies		Subject group		Obligatory subject group in the field of study		
Mode of study	part-time studies		Mode of delivery		at the university		
Year of study	2		Language of instruction		Polish Polish		
Semester of study	4		ECTS credits		8.0		
Learning profile	academic		Assessment form				
Conducting unit	Katedra Informatyki Ekonomicznej -> Faculty of Management						
Name and surname of lecturer (lecturers)	Subject supervisor		mgr Piotr Porzuczek				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	12.0	0.0	40.0	0.0	0.0	52
	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	52		30.0		120.0	202
Subject objectives	1. To provide an understanding of the concept and role of distributed application design technologies. 2. To familiarize students with the principles of controller design using the REST approach. 3. To provide practical experience in the implementation and management of distributed infrastructure.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[liEL3_W01] The student has advanced knowledge of the place of social sciences in the system of sciences, their nature, methodology and connections with other sciences.	liE_W01: Knowledge of economic sciences, their methodologies and connections.	[SW5] implementation of a problem task
	[liEL3_K04] The student is able to think and act in an entrepreneurial manner and adapt to the variability of the environment.	liE_K04: Is able to work in a team, co-create and manage a group. Is open to cooperation and aware of responsibility for assigned tasks.	[SK2] presentation/project/paper/report
	[liEL3_K05] The student is aware of the need for ethical, sustainable and socially responsible behavior in professional and social life.	liE1_K05: He thinks and acts in an entrepreneurial manner, adapting to changing environmental conditions.	[SK2] presentation/project/paper/report
	[liEL3_K03] The student can work in, co-create and manage a team; adapts his/her behavior and conduct to his/her role in it; is ready to take responsibility for the team and bear the consequences; understands the necessity of regularity and consistency in action; is open to other team members and critical of himself.	liE_K03: Ability to work in a team, organize group work.	[SK2] presentation/project/paper/report
	[liEL3_W04] The student has advanced knowledge of mathematical, statistical, econometric and computer methods of obtaining, processing and analysing data depicting the functioning and development of the national economy and its elements, as well as the phenomena and processes occurring in their environment.	liE_W04: Knows advanced mathematical methods , statistical and computer science methods used in the analysis of data on the economy and business processes .	[SW5] implementation of a problem task
	[liEL3_U08] The student can configure and apply advanced modern information and communication technologies in the process of business management and business communication.	liE_U08: Knows how to install, configure and use modern information technologies in management of enterprises .	[SU2] presentation/project/paper/report
	[liEL3_U04] The student can plan, design and program information systems to support the functioning of economic entities.	liE_U04: Design and programming of information systems.	[SU2] presentation/project/paper/report
Subject contents	Lectures: • Distributed application design concepts. • Routing, CORS, GraphQL. • REST approach and binary communication (gRPC). • Authentication and authorization. Exercises: • REST implementation in applications. • API Gateway configuration. • Implementing containers and serverless infrastructure. • Storing data in objects and files.		
Prerequisites and co-requisites	Operating systems, Scripting languages, Non-relational database solutions, Software engineering.		

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Examination	50.0%	50.0%
	Project	50.0%	50.0%
Recommended reading	Basic literature	- Newman S. (2021), <i>Building Microservices</i>, O'Reilly Media. - Richardson L. (2013), <i>RESTful Web APIs</i>, O'Reilly Media	
	Supplementary literature	- Burns B. (2018), <i>Designing Distributed Systems</i>, O'Reilly Media. - Ruby S. (2008), <i>RESTful Web Services</i>, O'Reilly Media.	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	Implementation of controllers in a REST approach including routing and CORS. Creating and managing tables in distributed systems. Using GraphQL to communicate with APIs in a distributed application. Authentication and authorization of users in a distributed system. Implementing containers for service encapsulation in a serverless infrastructure. Optimization of distributed services using API Gateway. Version management of data in objects and files. Application of snapshot techniques in instance hosting. Designing binary functions using Google Remote Procedure Call (gRPC). Implementation of task queuing in a distributed infrastructure.		
Work placement	Not applicable		

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