

Subject card

Subject name and code	Cloud Solutions, PG_00155063						
Field of study	Informatics and Econometrics						
Date of commencement of studies	October 2024		Academic year of realisation of subject		2026/2027		
Education level	Bachelor's studies		Subject group		Obligatory subject group in the field of study Subject group related to scientific research in the field of study		
Mode of study	part-time studies		Mode of delivery		at the university		
Year of study	3		Language of instruction		Polish		
Semester of study	5		ECTS credits		7.0		
Learning profile	academic		Assessment form		credit		
Conducting unit							
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Michał Kuciapski, prof. UG				
	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		25.0		100.0	177
Subject objectives	• To learn back-end and front-end programming languages for web applications through cloud computing. • Acquiring the ability to program and host dynamic sites in the cloud using data storage services. • Acquire the skills to create scalable solutions through auto-scaling horizontally: increasing the number of service instances; and vertically based on layers: service, blob storage, database, cache, worker role or microservice. • Acquire the ability to create highly interactive systems using notification services. • Acquire the ability to build solutions that integrate machine learning.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[liEL3_K01] The student understands the need to constantly supplement and deepen acquired knowledge; is open to new ideas and teaching methods.	strives to solve the presented problem of producing web applications through cloud computing, demonstrates creativity in the process of designing business services integrating services offered by cloud computing, adheres to the design specifications during the implementation of the programming project, efficiently manages the work of a project team preparing a dynamic cloud computing solution, efficiently team solves programming problems.	[SK2] presentation/project/paper/report
	[liEL3_U02] The student is able to acquire basic information about economic processes and phenomena by direct observation, planned experiment or database queries, and collect and process it using modern information technology tools.	is able to Integrate cloud services into current business websites; is able to design scalable business web services through auto vertical scaling mechanisms; is able to design scalable business web services through horizontal scaling mechanisms based on layers: service, blob storage, database, cache, worker role or microservices; is able to proficiently apply cloud computing services to optimize the performance of business applications; is able to implement solutions that incorporate security mechanisms for data access through centralized authentication and authorization available through cloud computing federation services.	[SU2] presentation/project/paper/report
	[liEL3_W05] The student has advanced knowledge of the sources of socio-economic data, their databases and ways of creating them.	knows and understands the principles and specifics of cloud programming	[SW2] presentation/project/paper/report
	[liEL3_W03] The student has advanced knowledge of man as an entity that creates economic structures and institutions.	has knowledge of the capabilities, benefits and limitations of cloud programming, identifies the applications of the various services available in the cloud for the preparation of interactive and scalable business applications.	[SW2] presentation/project/paper/report
	[liEL3_U04] The student can plan, design and program information systems to support the functioning of economic entities.	can identify the differences between key cloud computing services; designs modern business websites using the latest cloud computing services, such as blob repositories, redis cache and notification services	[SU2] presentation/project/paper/report

Subject contents	Lectures		
	1. Concept, role, and history of cloud computing technology. 2. Overview of cloud computing services. 3. Designing and deploying Infrastructure as a Service (IaaS). 4. Designing and deploying Software as a Service (SaaS). 5. Designing and deploying Database as a Service (DBaaS). 6. Designing and deploying the NoSQL Data layer. 7. Vertical and horizontal scaling of cloud services. 8. Designing and integrating distributed subsystems for asynchronous task execution. 9. Real-time communication.		
	Laboratory ClassesI. Azure:		
	1. Introduction to the Azure platform. 2. Deploying virtual machines as Infrastructure as a Service (IaaS). 3. Website design and deployment. 4. Cloud database services integration. 5. Vertical and horizontal scaling of web applications. 6. Tables and Blobs. 7. Queues and Worker Roles. 8. Redis Cache. 9. SignalR. 10. Notification Services. 11. Service Bus. 12. Cloud microservices. 13. Azure Machine Learning.		
	II. Amazon Web Services:		
	1. Introduction to Amazon Web Services (AWS). 2. Managing AWS solutions. 3. Utilizing AWS compute services. 4. Utilizing AWS storage services. 5. Working with AWS databases. 6. Utilizing AWS messaging services. 7. Creating CI/CD pipelines for application deployment in AWS. 8. Implementing AWS security practices using IAM, KMS, and MFA. 9. Configuring AWS services for optimal performance.		
Prerequisites and co-requisites	Distributed application programming, Front-end frameworks		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Team credit project	51.0%	100.0%
Recommended reading	Basic literature	• Trabelsi H. (2023), A Developer's Guide to Cloud Apps Using Microsoft Azure: Migrate and modernize your cloud-native applications with containers on Azure using real-world case studies, Packt • Lisdorf A. (2020), Cloud Computing Basics: A Non-Technical Introduction, Apress	
	Supplementary literature	• Wittig Andreas, Wittig Michael (2023) Amazon Web Services in Action, Manning	
	eResources addresses		
Example issues/ example questions/ tasks being completed	Design business application base on cloud services for storage, processing, notifications and other functions.		
Work placement	Not applicable		

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