University of Gdańsk

Subject card

Subject name and code	Cloud Computing, PG_00178067		
Field of study	Informatics and Econometrics		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2028/2029
Education level	Bachelor's studies	Subject group	Obligatory subject group in the field of study 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	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	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	4.0	96.0	175

Subject objectives

Learning back-end and front-end programming languages for web applications through cloud computing.

Acquiring skills in programming and hosting dynamic sites in the cloud using data storage services.
Using server-less services to create scalable applications.
Using artificial intelligence in applications thanks to cloud computing services.
Using Platform-as-a-Service and Infrastructure-as-a-Service solutions.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[IiEL3_U02] Can select or construct econometrics, informatics or statistics tools and apply them to describe and solve economic and social problems	The student is able to solve the presented problem using cloud computing applications.	[SU2] presentation/project/paper/ report
[IiEL3_W06] Knows and understands, to an advanced degree, the processes and methods of creating, developing, and providing appropriate conditions for using informatics or statistics tools, particularly those that improve human and organizational functioning	Understands the principles and specifics of cloud programming. Programs dynamic web applications hosted in the cloud. Uses artificial intelligence to recognize data.	[SW2] presentation/project/paper/ report
[IiEL3_U12] Can design and implement IT systems to enhance business operations and effectively utilize modern ICT technologies for management and business communication	The student is able to develop dynamic, cloud-hosted web applications. The student is able to utilize artificial intelligence for data recognition.	[SU2] presentation/project/paper/ report

<table>
<tr><td>Subject contents</td><td>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.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>Non-relational database solutions, Front-end frameworks, Distributed application programming.</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>final project</td><td>51.0%</td><td>100.0%</td></tr></table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>1. Fryźlewicz Z., Nikończuk D., Windows Azure. Wprowadzenie do programowania w chmurze, Helion 2022</td></tr>
<tr><td>Supplementary literature</td><td>1. Sunilkumar Manvi Gopal Shyam, Cloud Computing. Concepts and Technologies, Taylor & Francis 2024</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td>1. Develop a business application that uses a broad set of cloud computing services for data storage, processing, and visualization.</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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