University of Gdańsk

Subject card

Subject name and code	DevOps and Microservices, PG_00178738		
Field of study	Informatics and Econometrics		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2027/2028
Education level	Master'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	part-time studies	Mode of delivery	at the university
Year of study	2	Language of instruction	Polish
Semester of study	3	ECTS credits	7.0
Learning profile	academic	Assessment form	credit
Conducting unit	Department of Business Informatics -> Faculty of Management -> Rector		
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	8.0	0.0	32.0	0.0	0.0	40

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	40	2.0	133.0	175

Subject objectives

- Familiarize students with the DevOps philosophy and its impact on application development and deployment processes.
- Acquire the skills to automate processes using tools such as Jenkins.
- Implement the methodologies of Continuous Integration, Continuous Deployment, and Continuous Testing.
- Learn and practically apply concepts such as Infrastructure as Code, chaos engineering, immutable infrastructure, and shift-left security.Apply Agile methodologies within DevOps processes.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[IiEMU2_W08] Possesses a comprehensive understanding of the methods, conditions, directions, and dilemmas involved in applying advanced econometrics, informatics or statistics tools in response to dynamic environmental changes	IiE2_W08: Understands microservice architecture, design patterns used in distributed systems, and methods of communication between services, and knows the principles of designing scalable and fault-tolerant systems.	[SW4] test/exam - oral or written
[IiEMU2_U11] Can collaborate effectively in teams and assume leadership roles	IiE2_U11: Can containerize applications using Docker, manage containers in production environments, and configure and manage Kubernetes clusters for container orchestration.	[SU2] presentation/project/paper/ report
[IiEMU2_U12] Can adapt, design, create, and operate IT systems that support business entities	IiE2_U12: Can implement monitoring and observability of microservice systems using tools and analyze metrics and logs to diagnose problems and optimize performance.	[SU2] presentation/project/paper/ report
[IiEMU2_W06] Possesses a structured understanding of the processes, methods, and tools necessary for the design, creation, development, and provision of suitable conditions for informatics, econometrics or statistics tools	IiE2_W06: Knows advanced DevOps tools and technologies, including version control systems, CI/CD tools, containerization and orchestration systems, and understands their role in automating software development processes.	[SW4] test/exam - oral or written [SW2] presentation/project/paper/ report
[IiEMU2_U02] Can use conventional or innovative statistics, econometrics or informatics tools to analyze economic and social phenomena	IiE2_U02: Can design and implement CI/CD pipelines using tools such as Jenkins, GitLab CI, or GitHub Actions, automating the processes of building, testing, and deploying applications.	[SU2] presentation/project/paper/ report

Subject contents

Lectures:

Introduction to DevOps and its philosophy
Automation of application development and deployment processes
Continuous Integration (CI), Continuous Deployment (CD), Continuous Testing (CT)
Security in Jenkins
Infrastructure as Code, chaos engineering, immutable infrastructure
Practical application of DevOps in various industries (case studies)
Laboratories:
Jenkins architecture and configuration
Extending Jenkins with plugins and scripts
Integrating Jenkins with Docker and version control tools
Test automation with Selenium
Infrastructure as code: Ansible
Chaos engineering and immutable infrastructure

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Lecture: final exam	51.0%	50.0%
Laboratory: project evaluation	51.0%	50.0%

Recommended reading

Basic literature	Nicole Forsgren et al., Accelerate, 2019 Jose Manuel Ortega Candel, Container Security in DevOps, 2021
Supplementary literature	Jez Humble et al., Continuous Delivery, 2015
eResources addresses	

Example issues/ example questions/ tasks being completed

Automation of application creation and deployment using Jenkins
Application of Infrastructure as Code in team projects
Implementation of Agile methodologies in DevOps processes

Work placement

Not applicable

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