

**Subject card**

Subject name and code	DevOps and Microservices, PG_00177818						
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	full-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	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	<ul style="list-style-type: none"> <li>Familiarize students with the DevOps philosophy and its impact on application development and deployment processes.</li> <li>Acquire the skills to automate processes using tools such as Jenkins.</li> <li>Implement the methodologies of Continuous Integration, Continuous Deployment, and Continuous Testing.</li> <li>Learn and practically apply concepts such as <b>Infrastructure as Code</b>, <b>chaos engineering</b>, <b>immutable infrastructure</b>, and <b>shift-left security</b>. Apply Agile methodologies within DevOps processes.</li> </ul>						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[liEMU2_W08] The student 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.	liE2_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
	[liEMU2_U11] The student can collaborate effectively in teams and assume leadership roles.	liE2_U11: Can containerize applications using Docker, manage containers in production environments, and configure and manage Kubernetes clusters for container orchestration.	[SU5] implementation of a problem task
	[liEMU2_U12] The student can adapt, design, create, and operate IT systems that support business entities.	liE2_U12: Can implement monitoring and observability of microservice systems using tools and analyze metrics and logs to diagnose problems and optimize performance.	[SU5] implementation of a problem task
	[liEMU2_W06] The student 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.	liE2_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.	[SW5] implementation of a problem task
[liEMU2_U02] Students can use conventional or innovative statistics, econometrics or informatics tools to analyze economic and social phenomena.	liE2_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.	[SU5] implementation of a problem task [SU8] observation of student's independent or team work	
Subject contents	<p>Lectures:</p> <p>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)</p> <p>Laboratories:</p> <p>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</p>		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Laboratory: project evaluation	51.0%	50.0%
	Lecture: final exam	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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