COURSE DESCRIPTION

Course code	full-time studies	
	part-time-studies	
Course name	**Wirtualizacja i konteneryzacja**	
Course name in English	**Virtualisation and containerisation**	
Valid from academic year	**2022/23**	

PLACEMENT IN THE TEACHING PROGRAM

Field of study	**Computer Science**
Level of education	**1ˢᵗ degree**
Studies profile	**General**
Form and method of teaching classes	**Full-time and part-time studies**
Specialization	**Information and communication technology**
Organizational unit responsible for the course	**Katedra Systemów Informatycznych**
Course coordinator	**dr inż. Mirosław Płaza**
Approved by	**Dean of the Faculty of Electrical Engineering, Automatic Control and Computer Science Roman Deniziak, KUT prof., DSc, PhD**

GENERAL CHARACTERISTIC OF THE COURSE

Course affiliation		**Speciality**
Course status		**obligatory**
Language		**English**
Semester	full-time studies	**Semester VII**
	part-time-studies	**Semester VIII**
Requirements		**Computer networks**
Exam (YES/NO)		**NO**
ECTS		**3**

Course form		lecture	classes	laboratory	project	other
Hours per semester	full-time studies	**15**		**30**		
	part-time-studies	**9**		**18**		

LEARNING RESULTS

Category	Result Symbol	Learning Results	References to the field of study results
Knowledge	W01	Students know and understand the techniques of virtualisation of computing resources and distributed storage systems.	INF1_W30
	W02	Students know and understand containerisation and container management solutions.	INF1_W30
	W03	Students know and understand automation and security methods for virtualisation and containerisation systems.	INF1_W30
Skills	U01	Students are able to create virtual machines, manage them, and automate and secure their operation.	INF1_U30
	U02	Students are able to create and configure distributed storage systems.	INF1_U30
Social competence	K01	Students are aware of the importance of virtualisation and containerisation methods and their impact on social aspects.	INF1_K1 INF1_K2
	K02	Students are able to work in a group in the scope of virtualisation and containerisation,	INF1_K1 INF1_K2

COURSE CONTENT

Course Form	Content
lecture	1. **Introduction to virtualisation** (overview of computing resources virtualisation solutions, introduction to storage resources virtualisation, introduction to software-defined networking solutions) 2. **Virtualisation of computing resources** (virtual machines, network configuration, server farm management) 3. **Distributed storage systems** 4. **Introduction to containerisation** (building a container from scratch, container image, runtime environment, access to storage resources). 5. **Container management systems** – (discussion of components, basic objects, discussion of data access, communication between containers and network interfaces, storage interface). 6. **Automation of virtualisation and containerisation systems**
laboratory	1. Virtualisation – creating a virtual machine, virtual network management, configuration, physical link management. 2. Management of high availability mechanisms, cloning, building templates, export. 3. Network management on a single server – interfaces, tagging. 4. Building an overlay network directly on servers. 5. Distributed storage systems. 6. Containerisation – installing an environment, creating a container image, placing in a repository, running a container. 7. Containerisation – reviewing container logs, logging into a container, copying files to and from a container, accessing a fixed volume. 8. Automation of launching virtual machines in a selected environment. 1. Containerisation in the public cloud.

LEARNING RESULTS VERIFICATION METHODS

Result Symbol	Learning results verification methods					
	Oral Exam	Written Exam	Midterm	Project	Report	Other
W01			X			
W02			X			
W03			X			
U01			X			
U02			X			
K01			X			
K02			X			

ASSESSMENT FORMS AND CRITERIA

Course Form	Assessment Form	Assessment Criteria
lecture	pass with a grade	Obtaining at least 50% of the points from the pass tests during the laboratory classes.
laboratory	pass with a grade	Obtaining at least 50% of the points from the pass tests during the laboratory classes.

STUDENT'S VOLUME OF WORK

No.	Activity Type	Student Involvement										Unit
		full-time studies					part-time-studies					
1.	Participation in classes according to the schedule	Lec	C	Lab	P	S	Lec	C	Lab	P	S	h
		15		30			9		18			
2.	Other (consultations, exams)	2		2			2		2			h
3.	**Total with the direct assist of an academic teacher**	**49**					**31**					h
4.	**Number of ECTS, that students obtains with the direct assist of an academic teacher**	**1,96**					**1,24**					ECTS
5.	**Hours of unassisted student work**	**26**					**44**					h
6.	**Number of ECTS that student obtains working unassisted**	**1,04**					**1,76**					ECTS
7.	**Practical classes volume of work**	**30**					**18**					h
8.	**Number of ECTS obtained by student at practical classes**	**1,20**					**0,72**					ECTS
9.	**Total student's volume of work expressed in hours**	**75**					**75**					h
10.	**ECTS**	**3**										

BIBLIOGRAPHY

1. Andy Syrewicze and Richard Siddaway, **Pro Microsoft Hyper-V**, 2019
2. He Kun Yuan, **Linux KVM virtualization architecture practical guide**, 2017
3. Peter von Oven, **Delivering Applications with VMware App Volumes 4**, 2021
4. James Turnbull, **The Docker Book: Containerization is the new virtualization,** 2014
5. Nigel Poulton, **The Kubernetes Book**, 2022