COURSE DESCRIPTION

Course code	full-time studies	
	part-time-studies	
Course name	**Infrastruktury i usługi chmur obliczeniowych**	
Course name in English	**Cloud computing - infrastructures and services**	
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		**not obligatory**
Language		**English**
Semester	full-time studies	**Semester VI**
	part-time-studies	**Semester VII**
Requirements		**Computer networks**
Exam (YES/NO)		**NO**
ECTS		**4**

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

LEARNING RESULTS

Category	Result Symbol	Learning Results	References to the field of study results
Knowledge	W01	Students know and understand the applications of cloud computing solutions and their configuration options.	INF1_W33
	W02	Students know and understand the protocols and tools used in cloud computing.	INF1_W33
	W03	Students know and understand the methods of storing information in the cloud including data security aspects.	INF1_W33
Skills	U01	Students are able to create, configure and secure cloud environments.	INF1_U33
	U02	Students are able to create applications in development environments for cloud computing.	INF1_U33
Social competence	K01	Students are prepared to evaluate the importance of cloud computing and its impact on social aspects.	INF1_K1 INF1_K2
	K02	Students are prepared to work in a group in the scope of cloud computing.	INF1_K1 INF1_K2

COURSE CONTENT

Course Form	Content
lecture	1. **Introduction to cloud computing technology** (history of cloud computing and its classification, basic issues related to virtualisation of computer systems and operating system container technology) . 2. **Characteristics of cloud environments** (cloud computing infrastructures and service models such as IaaS, PaaS, SaaS and DaaS). 3. **Databases available in cloud computing** (working with data, accessing, storing and processing data in the cloud). 4. **Software** (software architecture using cloud computing technologies; cloud computing technologies and tools in software automation, development and distribution). 5. **Elements of artificial intelligence** (data processing using artificial intelligence methods with selected technologies). 6. **Security** (cloud security mechanisms, encryption, hashing, digital signatures, public key infrastructure, cloud-based security groups, enhanced virtual server images). 7. **Internet of Things technologies** (cloud computing in the context of IoT solutions, processing of data generated by IoT systems, security aspects). 8. **Legal aspects related to cloud solutions.**
laboratory	1. Creation of virtual environments using virtual machine technology. 2. Methods of data integration with external sources. 3. Distributed cloud computing systems. 4. Implementation of software solutions in cloud environments. 5. Tools for monitoring work, determining costs, adjusting resources. 6. Exploration of cloud services using elements of artificial intelligence. 7. Security of cloud computing services. 8. Exploration of cloud-based IoT solutions based on a selected environment.

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
		30		30			18		18			
2.	Other (consultations, exams)	2		2			2		2			h
3.	**Total with the direct assist of an academic teacher**	**64**					**40**					h
4.	**Number of ECTS, that students obtains with the direct assist of an academic teacher**	**2,56**					**1,60**					ECTS
5.	**Hours of unassisted student work**	**36**					**60**					h
6.	**Number of ECTS that student obtains working unassisted**	**1,44**					**2,40**					ECTS
7.	**Practical classes volume of work**	**30**					**18**					h
8.	**Number of ECTS obtained by student at practical classes**	**1,2**					**0,72**					ECTS
9.	**Total student's volume of work expressed in hours**	**100**					**100**					h
10.	**ECTS**	**4**										

BIBLIOGRAPHY

1. SK Singh, **Cloud Computing and AWS Introduction**, 2021
2. Sreelatha Sankaranarayanan, **Learning IBM Bluemix**, 2016
3. Christopher D. Bienko, **IBM Cloudant: Database as a Service Advanced Topics**, 2015
4. Tanmay Bakshi, **Cognitive Computing with IBM Watson: Build smart applications using artificial intelligence as a service**, 2019
5. Bill Chambers, **Spark: The Definitive Guide: Big Data Processing Made Simple**, 2018