COURSE DESCRIPTION CARD - SYLLABUS

Course name

Mechanisms of Violations and Ensuring Security in Cloud and DC and Security of Software-Defined Networks

Course

Field of study	Year/semester
Computing	1/2
Area of study (specialization)	Profile of study
Cybersecurity	general academic
Level of study	Course offered in
Second-cycle studies	English
Form of study	Requirements
full-time	elective

Number of hours

Lecture	Laboratory classes	Other (e.g. online)
20	30	
Tutorials	Projects/seminars	

Number of credit points
4

Lecturers

Responsible for the course/lecturer:

dr inż. Marek Michalski
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tel: 61 665 39 06
Faculty of Computing and Telecommunications

Responsible for the course/lecturer:

Prerequisites
Student has basic knowledge and experience about PC, virtualization, computer networks, IP protocols (including routing) and programming

Course objective
To show to students problems with security where cloud services are realized and data center is operated

Course-related learning outcomes
Knowledge

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The student understands the mechanisms that are used during the implementation of services in clouds and data centers, student is aware of their weaknesses and how to improve their security

Skills

The student is able to analyze the cloud system and data center, indicate possible threats and correlate the way of eliminating them

Social competences

Student understands that in the field of security his knowledge and skills very quickly become obsolete.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Written test, 51% to pass

Programme content

Basics of building clouds and cloud services

Technical and non-technical aspects of cloud services I

mplementation of selected services on examples from Google, MS, AWS and others

Tools and techniques for implementing cloud services

Mechanisms of security breaches Danger areas

 Protection mechanisms and the possibility of their automation

Tools for operators, service providers and customers

Examples of sources of disclosed problems

 DC General Building, DC Services and Mechanisms

 Principles of virtuality, Characteristics of clients

Mechanisms of occurrence of security breaches in DC

Threat categorization, command-and-control (C&C)

Mechanisms of defense against threats and their automation

Custom hardware for data Center (FPGA, option)

The lecture will include a visit to two (or more) data centers in Poznań, And also a meeting with people who work with security tools on a daily basis (security systems integrator) and companies providing services in the field of testing and increasing the level of security (companies from the local market and a well-known nationwide portal dealing with IT security)

Lab

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Practical familiarization with the test sample Cloud and Data Center environment

Virtualization of operating systems, computer networks and their functionalities (VM, NFV)

Getting to know typical WAF solutions, threat detection / threat protection tools, IDS / IPS (Intrusion Detection Systems / Intrusion Protection Systems)

Discovery of command-and-control (C&C) mechanisms

Teaching methods

Lecture with elements of discussion with students, demonstrations

Lab with experiments on real network, example of cloud and data centers

Bibliography

Basic

 Omar Santos, CCNP and CCIE Security Core SCOR 350-701 Official Cert Guide, Cisco Press, Hoboken, NJ, 2021

Additional

Breakdown of average student's workload

	Hours	ECTS
Total workload	100	4,0
Classes requiring direct contact with the teacher	50	2,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) [1]	50	2,0

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[1] delete or add other activities as appropriate