COURSE DESCRIPTION CARD - SYLLABUS

Course name
Security of Big Data Analytics

Course

Field of study
Computing
Area of study (specialization)
Cybersecurity
Level of study
Second-cycle studies
Form of study
Full-time

Year/Semester
1 / 2
Profile of study
general academic
Course offered in
English
Requirements
elective

Number of hours

Lecture
15
Laboratory classes
30
Other (e.g. online)
0
Tutorials
0
Projects/seminars
0

Number of credit points

2

Lecturers

Responsible for the course/lecturer:
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Responsible for the course/lecturer:
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Prerequisites

The student should have knowledge of the construction and operation of computer systems including both devices and protocols. He should also understand the need to expand his competencies and have the ability to obtain information from specified sources.

Course objective

Presentation of the theoretical and practical issues related to security of Big Data analytics.

Course-related learning outcomes

Knowledge

A student has advanced and detailed knowledge of the widely understood security of Big Data analytics. The student has knowledge about development trends in Big Data, AI, and Big Data security.

Skills

The student is able to obtain information about Big Data security from literature, databases and other sources (both in Polish and English). The student can also integrate knowledge about Big Data analytics and its security and is able to assess the usefulness of methods and tools for ensuring Big data security. He also is able to interact in a team, taking various roles in it and can determine the directions of further learning.

Social competences

The student understands that in the field of Big Data the knowledge and skills quickly become obsolete. He also understands the importance of using the latest knowledge.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Knowledge gained during lectures is verified by an test, which has a written or oral form depending on the size of the group. The written test consists of 30 test questions, where 4 answers are proposed, but only one answer is correct. The passing threshold is 50%. Final issues on the basis of which questions are prepared will be sent to students by e-mail using the university e-mail system. In the case of the oral test, each student answers three questions from the set of 40 (they are known to students). Questions are given by the person conducting the test. The correctness of the answer and the degree of understanding of the problem by the student is assessed.

Knowledge and skills acquired during laboratory exercises are verified by checking the correctness of the exercise. Lack of passing the exercise results in the need to repeat it within the time limit indicated by the teacher.

Programme content

Lectures:

1. Introduction to Big Data

(Big Data - what is this?, data characteristics and data value, data storage, data processing, the value of data in business, social and environmental applications)

2. Fundamentals of Big Data analysis

3. Artificial Intelligence for Big Data analysis

4. The use of Python in the processing of large data sets

(introduction to Python, libraries)

5. Security in modern ICT systems

6. Introduction to Big Data security

7. Internet of Things security

8. Good practices for the security of Big Data systems

9. Problems with Big Data sets

10. Problems with algorithms for Big Data analysis

11. Monitoring of Big Data analysis process

Laboratory exercises

The subject of laboratory exercises covers five blocks:

1. Preparation of the Big Data analytics environment

2. Deep learning in Big Data

3. Analysis problems with Big Data

4. Security of algorithms for Big Data analysis

5. Monitoring of Big Data analysis process

Teaching methods

Lecture: multimedia presentation supplemented with examples and additional explanations on the board. Lectures are conducted in accordance with the principles of traditional lecture, in justified cases taking the form of a conversational lecture.

Laboratory exercises: multimedia presentation, presentation illustrated with examples given on a blackboard, and performance of tasks given by the teacher - practical exercises.

Bibliography

Basic

1. Onur Savas, Julia Deng, "Big Data Analytics in Cybersecurity", Taylor & Francis Limited, 2021

2. Mostapha Zbakh, Mohamed Essaaidi, Pierre Manneback, Chunming Rong, "Cloud Computing and Big Data: Technologies, Applications and Security", Springer 2019

Additional

Websites devoted to Big Data, websites of vendors of Big Data solutions

Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,0
Classes requiring direct contact with the teacher	45	1,5
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) [1]	5	0,5

[1] delete or add other activities as appropriate