

Subject card

Subject name and code	Implementation of Big Data Solutions, PG_00156469						
Field of study	Information Science and Econometrics						
Date of commencement of studies	October 2024		Academic year of realisation of subject		2025/2026		
Education level	postgraduate studies		Subject group		Obligatory subject group in the field of study 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		English		
Semester of study	3		ECTS credits		7.0		
Learning profile	academic		Assessment form				
Conducting unit	Katedra Informatyki Ekonomicznej -> Faculty of Management						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Jacek Maślankowski				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	45.0	0.0	0.0	60
	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	60		30.0		85.0	175
Subject objectives	Familiarizing students with a comprehensive approach to the acquisition and processing of large data sets.						
	Preparing students to create Big Data solutions.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[liEMU2_K01] The student understands the need for continuous completion and deepening of acquired knowledge. The student inspires and organizes others' learning processes.	adheres to the principles of teamwork in the process of implementing systems, adheres to the principles related to data quality, willingly takes on challenges related to changing user requirements.	[SK2] presentation/project/paper/report
	[liEMU2_W05] The student has an in-depth knowledge of socio-economic data sources, their databases and how to create them.	understands the purpose of creating and using Big Data systems, critically evaluates Big Data solutions.	[SW4] test/exam - oral or written
	[liEMU2_K02] The student can communicate freely with the public on specialised topics in the field of computer science and econometrics in and outside the workplace, communicate his knowledge and share his skills through various media. Culturally participates in discussions, is not afraid to ask questions and knows how to give constructive criticism.	adheres to the principles of teamwork in the process of implementing systems, adheres to the principles related to data quality, willingly takes on challenges related to changing user requirements.	[SK2] presentation/project/paper/report
	[liEMU2_K03] The student is able to communicate freely with the public inside and outside the workplace, transfer his knowledge and share his skills through various media.	adheres to the principles of teamwork in the process of implementing systems, adheres to the principles related to data quality, willingly takes on challenges related to changing user requirements.	[SK2] presentation/project/paper/report
	[liEMU2_U04] The student is able to plan, design, and program information systems at an advanced level, supporting the operation of business entities.	designs web scraping scripts, creates NoSQL queries.	[SU2] presentation/project/paper/report
	[liEMU2_W04] The student has an in-depth knowledge of advanced mathematical, statistical, econometric and IT methods that enable the acquisition, processing and analysis of data reflecting the functioning and growth of the national economy and its components, as well as the phenomena and processes occurring in their environment.	understands the purpose of creating and using Big Data systems, critically evaluates Big Data solutions.	[SW4] test/exam - oral or written
	[liEMU2_U02] The student is able to proficiently acquire detailed information about economic processes and phenomena through direct observation, planned experimentation or database queries, as well as collect and process it using modern information technology tools.	designs web scraping scripts, creates NoSQL queries.	[SU2] presentation/project/paper/report

Subject contents	Lecture Introduction to Big Data, types of data, data division, classifications and technologies Web scraping techniques, generic and dedicated web scraping, legal conditions of web scraping NoSQL databases - collections and documents - creating, saving and downloading data Review of Big Data analytical tools, libraries supporting data processing Apache Hadoop Ecosystem Practical application of Data Mining, Text Mining, Web Mining Supervised and unsupervised machine learning Exercises Web scraping methods - using Python to automatically download data from the Internet Machine learning methods - supervised and unsupervised learning, the use of text and numerical sets Text mining methods automatic extraction of valuable information from text files Collecting large data sets - NoSQL databases, saving website content, creating and selecting queries Working with Open Data type data, using API Data processing from various file formats - JSON, CSV and XML Big data processing in Apache Hadoop and Apache Spark - PySpark application, MapReduce algorithms: WordCount analysis, HDFS - Hadoop Distributed File System Applications dedicated to web scraping Big Data implementation case studies		
	Prerequisites and co-requisites		
Assessment methods and criteria	Knowledge of the SQL language and the basics of creating databases.		
	Subject passing criteria	Passing threshold	Percentage of the final grade
	designing a system using Big Data solutions	51.0%	60.0%
	student's active participation in classes - points earned for correct solving of problems	51.0%	10.0%
	test - assessment of knowledge of Big Data solutions.	51.0%	30.0%

Recommended reading	Basic literature	Glass, R., Callahan, S., (2015) The Big Data-Driven Business: How to Use Big Data to Win Customers, Beat Competitors, and Boost Profits, John Wiley & Sons Documentation Apache Hadoop and Spark: http://hadoop.apache.org, http://spark.apache.org; Python: http://python.org, Education materials on pe.ug.edu.pl
	Supplementary literature	Deitel P., Deitel H., Python dla programistów. Big Data i AI. Studia przypadków, Helion, 2020 Mayer-Schonberger, V., Cukier, K., (2013) Big Data: A Revolution That Will Transform How We Live, Work, and Think, Eamon Dolan/Houghton Mifflin Harcourt
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	Types of Big Data Systems architectureData Types of Big Data	
Work placement	Not applicable	

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