COURSE DESCRIPTION CARD - SYLLABUS

Course name
Data Mining in the Analysis of User Behavior [S1DSwB1>DMwAZU]

Course

Field of study
Data Science in Business

Year/Semester
3/5

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
Polish

Form of study
full-time

Requirements
elective

Number of hours

Lecture
15

Laboratory classes
0

Other
0

Tutorials
15

Projects/seminars
0

Number of credit points

3,00

Coordinators

dr hab. Grzegorz Pawłowski
grzegorz.pawlowski@put.poznan.pl

Lecturers

Prerequisites

Basic knowledge of programming, database management and statistics.

Course objective

Providing knowledge and skills in using data mining techniques to comprehensively understand how to extract meaningful patterns from user interaction and behavior data.

Course-related learning outcomes

Knowledge:
Characterizes fundamental data mining techniques, including classification, clustering, association analysis, and regression in the context of user behavior analysis [DSB1_W01].
Describes the process of data acquisition, cleaning, and transformation in user behavior exploration, considering data from e-commerce and social media [DSB1_W02].
Explains strategies for analyzing multi-channel data sources and their impact on studying customer preferences [DSB1_W03].

Skills:

Selects appropriate user data mining methods, including classification algorithms, clustering, and regression analysis [DSB1_U02].
Implements data mining processes using Python, R, and analytical platforms such as Power BI and Tableau [DSB1_U03].
Designs user behavior analyses based on data from e-commerce and social media [DSB1_U08].

Social competences:
Critically analyzes the impact of data mining on user privacy and the ethical aspects of user data analysis [DSB1_K01].
Takes initiative in behavioral data analysis by implementing data mining techniques in business applications [DSB1_K04].

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Summative grade for the lecture is based on the percentage result from the test. Questions and tasks checking understanding of the topics. Passing threshold - 50%.
Formative laboratory assessment consists of grades that the student receives for completing individual tasks during classes. The summary grade from the laboratory is given as the average of these grades. The assessment takes into account the correctness and completeness of the results achieved.

Programme content

Lecture: Introduction to data mining. Data acquisition, verification, cleaning, transformation and reduction techniques to discover user behviour. Internet as a source of knowledge about customer preferences and behavior. Analysis of data obtained from e-commerce and social media sites. Acquiring data from multi-channel sources base on the "omnichannel" strategy.
Labs: Practical learning of data mining to discover possible classifications, clustering, associations, sequences and data correlations (regression analysis). The analyses will be carried out using programming in Python or R (locally or on cloud platforms) and using Power BI, Tableau tools to visualize results.

Course topics

1. Introduction to Data Mining.
2. Main data exploration techniques.
3. Web data mining techniques.
4. E-commerce data and social media analytics.
5. Multi-channel user data sources.

Teaching methods

Lectures: informative lecture, multimedia presentation, problem-based lecture.
Laboratories: laboratory method, case method (case study), workshop method.

Bibliography

Basic:
Mitchell R., Web Scraping with Python: Data Extraction from the Modern Web, 3rd Edition, O'Reilly Media, 2024.
Russell M.A., Klassen M., Mining the Social Web: Data Mining Facebook, Twitter, LinkedIn, Instagram, GitHub, and More, 3rd Edition, O'Reilly Media, 2019.
Diepeveen M-J., Artificial Intelligence with Power BI: Take your data analytics skills to the next level by leveraging the AI capabilities in Power BI, Packt Publishing 2022.
Milligan J.N., Learning Tableau 2022 5th ed. Edition, Packt Publishing 2022.

Additional:
Grus J., Data Science from Scratch: First Principles with Python 2nd Edition, O'Reilly Media 2019.
Kahn, M., Data Exploration and Preparation with BigQuery: A practical guide to cleaning, transforming, and analyzing data for business insights, Packt Publishing 2023.

Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,00
Classes requiring direct contact with the teacher	30	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	45	2,00