



COURSE DESCRIPTION CARD - SYLLABUS

Course name

BI Tools in Data Science [S1DSwB1>NBIwDS]

Course

Field of study

Data Science in Business

Year/Semester

2/4

Area of study (specialization)

–

Profile of study

general academic

Level of study

first-cycle

Course offered in

Polish

Form of study

full-time

Requirements

compulsory

Number of hours

Lecture

30

Laboratory classes

30

Other

0

Tutorials

0

Projects/seminars

0

Number of credit points

5,00

Coordinators

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Lecturers

Prerequisites

Basic knowledge of statistical analysis and data modeling in spreadsheets and databases .

Course objective

Providing knowledge and skills in using advanced data analysis techniques and methods of their effective presentation in modern decision-making systems.

Course-related learning outcomes

Knowledge:

Characterizes Business Intelligence tools and their application in data analysis and business decision-making processes [DSB1_W03].

Describes ETL (Extract, Transform, Load) techniques and methods for modeling data from various sources for analysis and reporting purposes [DSB1_W05].

Explains the principles of data visualization and KPI reporting, considering the use of BI in predictive analytics and machine learning [DSB1_W01].

Skills:

Applies BI tools for extracting, cleaning, transforming, and analyzing data from various local and network sources [DSB1_U04].

Creates interactive dashboards and reports using Power BI Desktop, including the visualization of key performance indicators (KPIs) [DSB1_U07].

Integrates data analysis results with machine learning models, presenting the outcomes in the BI environment [DSB1_U09].

Uses Data Storytelling methods to present analysis results and draw conclusions for business audiences [DSB1_U10].

Designs and implements BI solutions for a selected case study, tailoring analyses to specific business needs [DSB1_U05].

Social competences:

Considers the role of BI tools in data-driven decision-making and analyzes their impact on the business strategy of the organization [DSB1_K05].

Collaborates in analytical teams, integrating BI tools with data reporting and analysis processes to optimize business decisions [DSB1_K02].

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 the use of BI (Business Intelligence) tools in the field of Data Science. Methods of modeling data from various local and network sources (batch and streaming, also acquired in real time), in order to develop advanced reporting models and determine performance indicators (KPIs). Advanced use of BI tools to present machine learning results based on data obtained from cloud resources.

Labs: Practical learning of data processing for their analysis and visualization using Power BI Desktop. In particular, the student learns to retrieve, clean, format and filter data from various sources, both local and network. In addition, it uses advanced data analysis tools to create charts, graphs, maps, and other interactive presentations of data and key performance indicators. The final result of the own student's work is a business panel for the selected case study, which is made available online.

Course topics

1. BI concept and its tools.
2. ETL technique and data modeling.
3. Data visualization using various BI tools.
4. Data reporting and KPIs.
5. Machine learning and predictive analytics.
6. Data Storytelling - data insights and narratives.
7. Example case study, solution for a selected business problem.

Teaching methods

Lectures: informative lecture, multimedia presentation, problem-based lecture.

Laboratories: laboratory method, case method (case study), workshop method.

Bibliography

Basic:

Declar G., Powell B., Mastering Microsoft Power BI: Expert techniques to create interactive insights for effective data analytics and business intelligence, 2nd Edition, Packt Publishing 2022.

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. Create effective data visualizations, build interactive visual analytics, and improve your data storytelling capabilities - 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	125	5,00
Classes requiring direct contact with the teacher	60	2,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	65	2,50