



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Business Data Visualisation [S1DSwB1>WDB]

Course

Field of study

Data Science in Business

Year/Semester

2/3

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

0

Laboratory classes

0

Other

0

Tutorials

30

Projects/seminars

0

Number of credit points

2,00

Coordinators

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Lecturers

Prerequisites

The student should possess the following skills and knowledge: • Basic knowledge of Microsoft Excel spreadsheets. • Basic knowledge of data analysis.

Course objective

The objective of this course is to develop skills in effectively presenting and analyzing data in a business context. Students will learn how to design clear and intuitive visualizations that facilitate managerial decision-making. The course aims to familiarize students with the principles of data perception, best practices for visualization, and tools for interactive reporting. Students will acquire practical skills in data preparation, building relational data models, as well as creating dynamic and interactive charts and dashboards. Additionally, the course will help students understand how to effectively present the results of quantitative analyses, including correlation analyses, cross-tabulation tables, and geographical data. The automation of visualization processes using macros and data processing tools will also be discussed.

Course-related learning outcomes

Knowledge:

Characterizes the principles of data perception, color selection, and methods for designing clear and transparent visualizations [DSB1_W01].

Describes tools and techniques for data visualization in environments such as Power BI and Excel, including methods for data transformation and modeling (star schema, DAX language) [DSB1_W03].

Skills:

Creates interactive visualizations and dashboards in Power BI and Excel, tailoring them to business analysis needs [DSB1_U04].

Designs and creates advanced dynamic charts, demographic charts, waterfall charts, and maps for presenting spatial and geographical data [DSB1_U04].

Analyzes correlations between qualitative and quantitative features using cross-tabulation tables and scatter plots [DSB1_U04].

Automates data analysis processes by using macros and text file processing in Excel [DSB1_U14].

Social competences:

Critically analyzes their own knowledge and skills in data visualization, striving for continuous improvement in designing reports and dashboards [DSB1_K01].

Collaborates in interdisciplinary teams, designing visualizations tailored to business needs and effective communication of data analysis results [DSB1_K03].

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Project implementation, where students must demonstrate the ability to apply the knowledge gained in practice. The project includes the following stages:

- Data selection and acquisition
- Data preparation
- Designing interactive visualizations
- Data analysis and interpretation
- Presentation of results

Programme content

The course covers topics related to the effective presentation of business data, the use of visualization tools, and data processing and analysis methods. The principles of designing clear and readable visualizations and techniques for effectively conveying information will be discussed. Students will learn the basics of data, color, and image perception, enabling them to consciously design visualizations. The course will cover data visualization tools. Students will learn how to create interactive visualizations and reports, as well as build dashboards and tiles. It also includes loading and transforming source data from data warehouses, files, and the internet into Excel and Power BI. Methods for preparing data for modeling and error handling will also be discussed.

Students will be introduced to building relational data models, including star schemas, as well as the basics of the DAX language and query optimization. Advanced Excel functions will be covered, including creating dynamic charts with a selectable start and end date, demographic charts, waterfall charts, and dynamic charts with a selectable series and name.

Students will learn to use macros to automate processes and work with text files in Excel. The course also includes quantitative research in management, covering types and measurement scales of variables, forms of graphical data presentation, tables, and frequencies.

The correlation analysis of qualitative features using cross-tabulation tables and the correlation analysis of quantitative features using scatter plots will be discussed. Students will be introduced to tools for creating maps and charts, enabling them to effectively present spatial and geographical data.

Course topics

Theoretical basics of visualization - data, color, and image perception, principles of designing visualizations.

Practical tools - Power BI and Excel as the main environments for data analysis and visualization.

Data preparation - loading, transformation, modeling (star schema, DAX).

Advanced visualizations - dynamic charts, demographic charts, waterfall charts, maps.

Statistics in visualization - correlation analysis, cross-tabulation tables, presentation of quantitative and qualitative data.

Automation - macros and text file processing.

Teaching methods

Practical classes using computers. Analysis of real business problems and solutions using data visualization. Group project.

Bibliography

Basic:

Materials provided by the instructor.

Additional:

Johansson, R. (2021). Matematyczny Python: obliczenia naukowe i analiza danych z użyciem NumPy, SciPy i Matplotlib (F. Kamiński, Tłum.). Wydawnictwo Naukowe PWN

Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,00
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)	20	1,00