



Course title: METHODS FOR VISUALIZING DATA AND INFORMATION

ECTS credit allocation (and other scores): 4

Semester: spring

Level of study: ISCED-6 - first-cycle programmes (EQF-6)

Branch of science: Social sciences

Language: English

Number of hours per semester: 30

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Type of classes: classes

Substantive content

CLASSES: Classes include the development of the ability to present raw data, information and analysis results by means of known visualization methods. The correct selection of visualization tools and techniques adapted to the type of information resources presented and the purpose of elaborating a clear data and information report. Testing all the data and information visualization techniques discussed in the lecture section and iteratively improving the readability of the reports. The latest trends in the development of interactive reports for business, politics, security services, rescue, civil engineering, environmental protection, etc.

LECTURES: Characteristics of graphic tools for visualization. Visualization on maps and photographs. Charts for raw data (linear, bar, pictorial, scatter), charts for the price of variable distributions (normality charts, histograms), frame charts, dependency diagrams (correlations, regressions), complex plots (categorized, cross-sectional, merged). Graph exploration (rotating, zooming, panning, hiding planes and frames). Automation processes for creating and customizing charts. Data and information report. The use of tables and diagrams, colour effects, dashboards and infographics in the development of modern data and information visualization. Perception of images, colours and data. Basics of three-dimensional data visualization (3D visualization, 3D navigation, 3D data import, 3D animation creation).

Learning purpose: The methodology of presenting raw data, information and results of statistical analyses by means of effective visualization. Presenting many different data and information in a limited area, selecting and displaying information to simplify and introduce consistency of the message and the process of inference. The correct message is an element encouraging the observer to deeper analysis of data and information.

On completion of the study programme the graduate will gain:

Knowledge: Has knowledge of engineering and system analysis as well as knowledge of data protection, system security and reliability, information visualization and security, including ICT security

Skills: When formulating and solving engineering tasks, can see systemic and non-technical aspects

Social Competencies: Is able to cooperate during the implementation of various tasks and projects. Is aware of the importance and understands managerial aspects and effects of engineering activities, including its impact on safety and the environment

Basic literature: 1) Korsak W., Wizualizacja informacji w biznesie, wyd. Novae Res, 2015; 2) Murray S., Interaktywna wizualizacja danych, wyd. Helion, Gliwice, 2014; 3) Hill T., Lewicki P., STATISTICS Methods and Applications, wyd.



Wydawnictwo StatSoft, 2006; 4) Osińska V, Wizualizacja i wyszukiwanie dokumentów, wyd. SBP, Warszawa, 2010; 5) Steele J., Ilinsky N., Beautiful Visualization: Looking at Data Through the Eyes of Experts, wyd. O'Reilly, 2010.

Supplementary literature: 1) Alexander M., Walkenbach J., Analiza i prezentacja danych w Microsoft Excel, wyd. Helion, Gliwice, 2011; 2) Chen C., Information Visualization. Beyond the Horizon, wyd. Springer, 2008; 3) Ware C., Information Visualization: Perception for Design, wyd. Morgan Kauffman, 2000.

The allocated number of ECTS points consists of:

Contact hours with an academic teacher: 2

Student's independent work: 2