#### card of course

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| Subject name | Data analysis and visualization platforms |

1. The placement of the subject in the study system

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| 1.1. Field of study | Computer science |
| 1.2. Form and path of study | Full-time/Part-time |
| 1.3. Level of education | First-cycle studies |
| 1.4. Study profile | Practical |

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| 1. 5. Specialty | - |
| 1.6. Subject Coordinator | Dr Michał Kalisz |

2. General characteristics of the subject

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| 2.1. Belonging to a subject group | directional/practical |
| 2.2. Number of ECTS | 2 |
| 2.3. Language of lectures | Polish |
| 2.4. Semesters in which the subject is taught | VII |
| 2.5.Criteria for selecting course participants | - |

1. Learning outcomes and course delivery
   1. Subject Objectives

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| --- | --- |
| No. | Subject Objectives |
|
| C1 | Familiarization with popular data analysis and visualization platforms such as Tableau, Power BI and Excel. |
| C2 | Developing skills in creating interactive reports and data visualization. |
| C3 | Preparation for working with analytical tools in a business and scientific context. |

* 1. Subject-specific learning outcomes, divided into knowledge , skills and competences , with reference to the directional learning outcomes

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| No. | Description of subject  learning outcomes | Reference to  directional effects  learning (symbols) | Method of implementation (mark "X") | | | |
| ST | | NST | |
| Classes at the University | Activities on  the platform | Classes at the University | Activities on  the platform |
| After passing the course, the student knows and understands **the knowledge** | | | | | | |
| W1 | Knows the features and capabilities of the Tableau, Power BI and Excel platforms in terms of data analysis. | INF\_W07 INF\_W19 INF\_W20 |  | X |  | X |
| W2 | Understands the principles of creating data visualizations, including charts, maps, and dashboards. |  | X |  | X |
| W3 | Knows the methods of processing and analyzing data in graphical environments, without the need for programming. |  | X |  | X |
| After passing the course, the student is **able** to: | | | | | | |
| U1 | Can import data from various sources (CSV, databases, API) to the selected analytical platform. | INF\_U19 INF\_U21 INF\_U27 | X |  | X |  |
| U2 | Can create interactive data visualizations such as charts, pivot tables, and dashboards. | X |  | X |  |
| U3 | Is able to analyze data and draw conclusions using visual tools available in analytical platforms. | X |  | X |  |
| After completing the course, the student is ready to take part in **social competences.** | | | | | | |
| K1 | Understands the importance of visualization in communicating data analysis results. | INF\_K01 | X |  | X |  |

3.3. Forms of teaching and their number of hours - Full-time studies (ST), Part-time studies (NST)

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Path | Lecture | Exercises | Design | Workshop | Laboratory | Seminar | Lecturer | Classes conducted using distance learning methods and techniques in the form of a lecture. | Other | **ECTS points** |
| **ST** |  |  |  |  | 15 |  |  | 15 |  | 2 |
| **NST** |  |  |  |  | 10 |  |  | 10 |  | 2 |

3.4. Content of education (separately for each form of classes: (W, ĆW, PROJ, WAR, LAB, LEK, OTHER). It should be marked (X) how the given content will be implemented (classes at the university or classes on the e-learning platform conducted using distance learning methods and techniques)

TYPE OF CLASS: LECTURE

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| --- | --- | --- | --- | --- | --- | --- |
| No. | Content of the course | Reference to subject-specific learning outcomes | Method of implementation (mark "X") | | | |
| ST | | NST | |
| **Classes at the University** | **Activities on  the platform** | **Classes at the University** | **Activities on  the platform** |
| 1. | Introduction to data analysis and visualization platforms, overview of Tableau, Power BI, Excel. | W1 |  | X |  | X |
| 2. | Create basic visualizations such as line, bar and pie charts, W2, U2 . | W2 |  | X |  | X |
| 3. | Visualizations: Line, Bar and Pie Charts | W2 |  | X |  | X |
| 4. | Analytical functions in Excel | W3 |  | X |  | X |
| 5. | Summary of classes and discussion of grades |  |  | X |  | X |

TYPE OF CLASS: LABORATORY

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| No. | Content of the course | Reference to subject-specific learning outcomes | Method of implementation (mark "X") | | | |
| ST | | NST | |
| **Classes at the University** | **Activities on  the platform** | **Classes at the University** | **Activities on  the platform** |
| 1. | Importing data from various sources, processing and cleaning data in analytical environments. | U1 | X |  | X |  |
| 2. | Create basic visualizations such as line charts, bar charts, and pie charts. | U2, K1 | X |  | X |  |
| 3. | Designing interactive dashboards and reports in Tableau and Power BI, | U2, K1 | X |  | X |  |
| 4. | Data analysis using pivot tables and analytical functions in Excel. | U3, K1 | X |  | X |  |
| 5. | Summary of classes and discussion of grades |  | X |  | X |  |

3.5. Methods of verifying learning outcomes (indication and description of methods of conducting classes and verification of achievement of learning outcomes and method of documentation)

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| --- | --- | --- | --- |
| Subject Effects | Teaching methods | Methods of verifying learning outcomes | Documentation methods |
| KNOWLEDGE | | | |
| W1-W3 | Lectures using presentations and tools | Test on the platform | Archived test on the platform |
| SKILLS | | | |
| U1-U3 | Practical classes performed at computer stations | Team Project:  Students complete an analytical project in teams, which involves preparing an interactive report in a selected analytical platform (Tableau, Power BI, Excel). The project includes data import, analysis, creation of visualizations, and preparation of a dashboard. | Archived project on the platform |
| SOCIAL COMPETENCES | | | |
| K1 | Practical classes performed at computer stations | Team Project:  Students complete an analytical project in teams, which involves preparing an interactive report in a selected analytical platform (Tableau, Power BI, Excel). The project includes data import, analysis, creation of visualizations, and preparation of a dashboard. | Archived project on the platform |

3.6. Assessment criteria for the achieved learning outcomes

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| --- | --- | --- | --- | --- | --- |
| Learning effect | For a grade of 3 or "pass."  the student knows and understands/is able to/is ready to | For a grade of 3.5, the student knows and understands/is able to/is ready to | For a grade of 4, the student knows and understands/is able to/is ready to | For a grade of 4.5, the student knows and understands/is able to/is ready to | For a grade of 5, the student knows and understands/is able to/is ready to |
| W | 51-60% of knowledge indicated in learning outcomes | 61-70% of knowledge indicated in learning outcomes | 71-80% of knowledge indicated in learning outcomes | 81-90% of knowledge indicated in learning outcomes | 91-100% of knowledge indicated in learning outcomes |
| U | 51-60% of skills indicated in learning outcomes | 61-70% of skills indicated in learning outcomes | 71-80% of skills indicated in learning outcomes | 81-90% of skills indicated in learning outcomes | 91-100% of skills indicated in learning outcomes |
| K | 51-60% of skills indicated in learning outcomes | 61-70% of skills indicated in learning outcomes | 71-80% of skills indicated in learning outcomes | 81-90% of skills indicated in learning outcomes | 91-100% of skills indicated in learning outcomes |

3.7. Literature

**Basic**

* Fisher Danyel ; Meyer Miriah, Making data visual : a practical guide to using visualization for insight O'Reilly Media Sebastopol, 2018
* Alexander M., Kusleika D., Walkenbach J., Microsoft Excel® 2019 PL : biblia, Helion, 2019

**Supplementary**

* Finch Victor; Data Analytics For Beginners: Your Ultimate Guide To Learn And Master Data Analysis. Get Your Business Intelligence Right – Accelerate Growth And Close More Sales Createspace Independent Publishing Platform; Scotts Valley; 2017
* Cole Nussbaumer Knaflic, "Storytelling danych. Poradnik wizualizacji danych dla profesjonalistów", Onepress 2019

4. Student workload - ECTS points balance

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| --- | --- | --- |
| **Types of student activity** | **Student Load** | |
| **ST** | **NST** |
| **Classes requiring direct contact between the student and the academic teacher at the university premises** | **30** | **20** |
| Classes included in the study plan | 30 | 20 |
| **Student's own work** | **20** | **30** |
| Ongoing preparation for classes, preparation of project work/presentations/etc. | 10 | 15 |
| Preparation for passing classes | 10 | 15 |
| **TOTAL STUDENT HOURLY LOAD** | **50** | **50** |
| **Number of ECTS points** | **2** | **2** |

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| Last change date | 30/09/2024 |
| The changes were introduced | INF Education Quality Team |
| The changes were approved | Arkadiusz Gwarda, M.A. |